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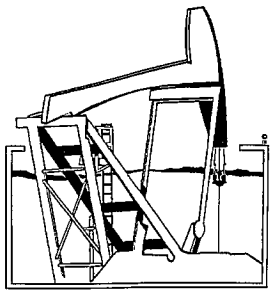

CRIMSON RESOURCE MANAGEMENT CORP.

5001 California Avenue, Suite 206
Bakersfield, CA 93309
Phone 661-716-5001 x31 Fax 661-716-5008

RECEIVED
JUN 15 2015
RWQCB-CVR
FRESNO, CALIF.

June 11, 2015

Mr. Ronald Holcomb
CVWB
1685 E Street
Fresno, CA 93706

RE: Section 13267 Order Dated April 1, 2015

Dear Mr. Holcomb,

Enclosed is Crimson's response to referenced order. Please contact me if you have any questions or concerns.

Sincerely,
CRIMSON RESOURCE MANAGEMENT CORP.

Kristine Boyer
Environmental Health and Safety Supervisor
661.716.5001 ext 31 Office
661.343.3205 Cell
kboyer@crimsonbak.com

Enc

Crimson Resource Management Corp.
Response to the CVRWQCB Section 13267 Order
Dated April 1, 2015
Regarding
Wastewater Disposal Ponds

June 15, 2015

Submitted to:
Ronald Holcomb
Central Valley Water Board
1685 E Street
Fresno, CA 93706

Submitted by:
Crimson Resource Management Corporation
5001 California Avenue, #206
Bakersfield, CA 93309

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CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: 

Name: Gary Buntmann

Title: *President*

Date: 6/10/15

PROFESSIONAL GEOLOGIST STATEMENT

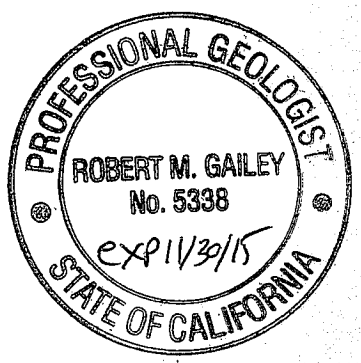
Registered California Professional Geologist:
In accordance with the requirements of the Section 13267 Order dated April 1, 2015, I have reviewed this report.

Robert M. Gailey, P.G., C. HG.

P.G. 5338, C.HG. 259 — Registration Number
CA — State

6/5/15
Date Signed

SEAL:



1.0 INTRODUCTION

This report has been prepared by Crimson Resource Management Corp., a Colorado corporation (Crimson) in response to a California Water Code Directive Pursuant to Section 13267 dated April 1, 2015 (Order) issued by the Central Valley Regional Water Quality Control Board (CVRWQCB). The Order requires a technical report that presents the following:

1) Identification of any discharges of oil field produced waters to land, including but not limited to ponds, since April of 2014 that are not listed in Attachment A of the Order,
2) Pond wastewater sampling and chemical analysis consistent with the requirements of Attachment B of the Order,
3) All available information for each of the wastewater ponds listed in the Order, and
4) A map that meets requirements specified in Order Section 1D.

2.0 DESCRIPTION OF FACILITIES AND OPERATIONS

2.1 Facility Locations

There are three leases listed in Attachment A of the Order that are operated by Crimson Resource Management Corp:

A) The Asphalto Standard lease is located in the Asphalto Oilfield approximately two miles southeast of the unincorporated community of McKittrick, in the western half of tsouthwestern quarter of Section 23, T30S, R22E, Mount Diablo Base and Meridian (MDB&M);

B)The Anderson lease is located in the Cymric Oilfield approximately nine miles northwest of the unincorporated community of McKittrick in the eastern half of the northeastern quarter of Section 19, T29S, R21E, MDB&M; and

C) The Kern County Land lease 31 (KCL 31) is located in the Rosedale Ranch Oilfield located in Bakersfield in Section 1, 29S, R26E, MDB&M.

The Anderson lease and KCL 31 do not have any active or historical discharges to land. This was conveyed to Doug Patteson of the CVRWQCB in a certified letter from Crimson dated April 8, 2015. Therefore, these two leases will not be discussed further in this report.

The Asphalto Standard lease currently has active discharges to land. Figure 1 indicates the facility location on a U.S. Geological Survey 7.50-minute series topographic map. Figure 2 indicates the boundary line of the Asphalto Standard lease.

The Order requires the identification of any discharges of oil field produced waters to land, including but not limited to ponds, since April of 2014 that are not listed in

Attachment A of the Order. Crimson does not have any other discharges of oil field produced water to land since April of 2014 that is not listed in the Attachment A of the Order.

2.2 *Asphalto Standard Site Description*

The Asphalto Standard facility is located on an 80 acre parcel listed as Assessor Parcel Number 157-210-05. There are 16 earth-lined sumps that cover an area of approximately nine acres (Figure 3) at Latitude -119.588177, Longitude 35.299707. The sumps vary in size from 40 feet wide (Sump #16) to 265 feet wide (Sump #11) and from 90 feet long (Sump #1) to 240 feet long (Sump #15).

The sumps run in a series with the point of discharge to the sumps beginning at the above ground wastewater tank located in the Asphalto Standard Tank Battery. When the wastewater is not injected underground, it is sent from the wastewater tank via pipeline into Sump #1 located just to the northwest of the tank. Typically, wastewater flows from Sump #1 into Sump #2 then into Sump #12, #3, #8, #9, #4, #10, #5, #6, #7 then finally into Sump #11. If it is necessary to utilize additional sumps, water from Sump #12 could be diverted into Sumps #13-#16.

In 2010, the sumps were cleaned out and re-graded. The containment berms were rebuilt to satisfy the existing Waste Discharge Requirements (WDRs) and sump design requirements to prevent leakage from erosion, slope failure and animal burrowing. Final grading was inspected and approved by the Kern County Resource Management Agency. In addition, the fence around sumps #1 through #11 and netting over sumps #1 and #2 were repaired. The sumps are designed to have sufficient freeboard to prevent overtopping as a result of heavy rains, winds or earthquakes.

2.3 *Asphalto Standard Lease Operations*

Crimson is the owner and operator of crude oil production wells, disposal wells and wastewater disposal ponds "sumps" on the Asphalto Standard lease. In association with crude oil, non-hazardous brine water "produced wastewater" is brought up to the surface from the hydrocarbon bearing zone. This produced water is either disposed in Class II disposal wells or in sumps.

The Class II disposal wells are regulated by the Division of Oil, Gas and Geothermal Resources. Pursuant to 40 Code of Federal Regulation (40 CFR), Section 146.4, the Tulare Formation in the Asphalto Oil Field has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons.[1] These wells are not the subject of the Order and therefore will not be discussed further in this report.

[1] Order No. R5-2004-0058 page 2 of Information Sheet.

The sumps are currently regulated by WDRs, Resolution No. 64-05001 and Order No. R5-2004-0058. The WDRs are attached as Appendix A. Crimson discharges approximately 700 bbls/day of produced wastewater for disposal by solar evaporation and percolation. Annual reports detailing water discharge volumes and quality analysis are submitted to the CVRWQCB in April of each year. Additional information on operations monitoring can be found in these annual reports.

2.4 *Discharge Volumes*

The Order requests all available information on duration of discharge (in months) and the volume of wastewater discharged per year. Table 1 lists discharge volumes months of May – April for the last five years.[2]

Table 1
Asphalto Standard Lease Discharge Volumes

Month	Year	Volumes (bbls)
May	2010	0
June	2010	38045
July	2010	4923
August	2010	5853
September	2010	11170
October	2010	9197
November	2010	23985
December	2010	37332
January	2011	41603
February	2011	49199
March	2011	5743
April	2011	836
Total		227886

Month	Year	Volumes (bbls)
May	2011	1733
June	2011	12905
July	2011	0
August	2011	0
September	2011	0
October	2011	0
November	2011	0
December	2011	0
January	2012	13449
February	2012	26661
March	2012	0
April	2012	0
Total		54758

Month	Year	Volumes (bbls)
May	2012	0
June	2012	0
July	2012	0
August	2012	11930
September	2012	14324
October	2012	0
November	2012	0
December	2012	0
January	2013	9867
February	2013	22276
March	2013	0
April	2013	0
Total		58397

Month	Year	Volumes (bbls)
May	2013	0
June	2013	0
July	2013	0
August	2013	0
September	2013	31830
October	2013	41250
November	2013	42604
December	2013	0
January	2014	0
February	2014	0
March	2014	0
April	2014	0
Total		139844

Month	Year	Volumes (bbls)
May	2014	0
June	2014	73
July	2014	0
August	2014	0
September	2014	0
October	2014	285
November	2014	230
December	2014	965
January	2015	1435
February	2015	350
March	2015	0
April	2015	0
Total		3338

[2] Five year period determined via phone conversation with Dane Johnson, CVRWQCB on or around May 15, 2015. Data presented is from annual reports submitted to the CVRWQCB in compliance with WDRs.

3.0 WATER QUALITY SAMPLING AND ANALYSIS

3.1 Representative Sample Location

The location where wastewater sampling occurs is defined according to the conditions of the Monitoring and Reporting Program of the WDRs. The WDRs indicate that wastewater be sampled at the point of discharge into the sumps. The point of discharge is the sample box at the wastewater tank located in the Asphalto Standard Tank Battery.

3.2 Sampling Events

Data from two recent sampling events are included in this report and are presented together in tables presented below.

The first sampling event occurred January 8, 2015 when Zachary Jarvie, Engineering Geologist of the CVRWQCB, inspected the sumps and obtained a sample of the wastewater. The sample was taken at the point of discharge into the sumps. The sample identified as ZJJ150801-1 was submitted to Moore Twining Associates, Inc. as project 13-014-150-01. Moore Twining Associates, Inc is an ELAP-accredited laboratory (ELAP #1371). A copy of the inspection report is presented in Appendix B.

The second sampling event occurred April 14, 2015 when Jeremiah Johnson of Zalco Laboratories, Inc. obtained a sample for the purpose of complying with this April 1, 2015 Order. This sample is identified as 1504150-01. The sample was taken at the point of discharge into the sumps according to procedures described in Crimson's Operations and Maintenance Plan for the facility (Appendix D). Zalco Laboratories Inc. is an ELAP-accredited laboratory (ELAP #2791). Appendix C includes a copy of the laboratory analysis.

3.3 Sample Analysis Requirements per the Order

The Order requires that wastewater samples be analyzed for the following:

A. Total dissolved solids;

B. Metals listed in California Code of Regulations, title 22, section 66261.24, subdivision (a)(2)(A);

C. Benzene, toluene, ethylbenzene, and xylenes;

D. Total petroleum hydrocarbons as crude oil;

E. Polynuclear aromatic hydrocarbons (including acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[b]bfluoranthene, benzo[a]pyrene, benzo[g,h,i]perylene, chrysene, dbenzo[a,h]anthracene, fluoranthene, fluorine, indeno[1,2,3-cd]pyrene, naphthalene, phenanthrene, and pyrene);

F. Radionuclides listed under California Code of Regulations, Title 22, Table 64442;

G. Major and minor cations (including sodium, potassium, magnesium, and calcium);

H. Major and minor anions (including nitrate, chloride, sulfate, carbonate, bicarbonate, and bromide);

I. Trace elements (including lithium, strontium, boron, iron, and manganese.

3.4 Analysis Results

The sampling results discussed below are attached as Appendices B and C. The Appendix B results have also been submitted to the CVRWQCB as an Excel spreadsheet as required by the April 1, 2015 Order.

3.4.1 Total Dissolved Solids

The Total Dissolved Solids (TDS) from the two recent sampling events show a range of 32,000 milligrams per liter (mg/L) to 34,000 mg/L.

3.4.2 Metals

Table 2 presents the metals listed in California Code of Regulations, Title 22, section 66261.24, subdivision (a)(2)(A) and the results of both samples.

Table 2 Metals

Sample Date: January 8, 2015 Sample Date: April 14, 2015

Sample ID ZJJ150108-1	Results	Method	Sample ID 1504150-01	Results	Method
Antimony	.0013 mg/L	EPA 200.8	Antimony	<0.20 mg/L	SW846 6010B
Arsenic	.076 mg/L	EPA 200.8	Arsenic	0.062 mg/L	SW846 6010B
Barium	21 mg/L	EPA 200.8	Barium	12 - 18 mg/L	SW846 6010B
Beryllium	ND	EPA 200.8	Beryllium	<0.10 mg/L	SW846 6010B
Cadmium	ND	EPA 200.7	Cadmium	<0.10 mg/L	SW846 6010B
Chromium	ND	EPA 200.8	Chromium	<0.050 mg/L	SW846 6010B
Cobalt	.001 mg/L	EPA 200.7	Cobalt	<0.10 mg/L	SW846 6010B
Copper	.2mg/L	EPA 200.8	Copper	<0.050 mg/L	SW846 6010B
Lead	ND	EPA 200.8	Lead	<0.050 mg/L	SW846 6010B
Mercury	ND	EPA 200.8	Mercury	<0.0020 mg/L	SW846 6010B
Molybdenum	.0037mg/L	EPA 200.8	Molybdenum	<0.10 mg/L	SW846 6010B
Nickel	.38mg/L	EPA 200.8	Nickel	0.056 mg/L	SW846 6010B
Selenium	.25 mg/L	EPA 200.8	Selenium	<0.05 mg/L	SW846 6010B
Silver	ND	EPA 200.8	Silver	<0.020 mg/L	SW846 6010B
Thallium	ND	EPA 200.8	Thallium	<0.50 mg/L	SW846 6010B
Vanadium	.0056 mg/L	EPA 200.8	Vanadium	<0.10 mg/L	SW846 6010B
Zinc	.0077 mg/L	EPA 200.8	Zinc	<0.050 mg/L	SW846 6010B

3.4.3 Benzene, Toluene, Ethylbenzene And Xylenes

Table 3 presents the results for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX).

Table 3 Benzene, Toluene, Ethylbenzene And Xylenes

Sample Date: January 8, 2015			Sample Date: April 14, 2015		
Sample ID ZJJ150108-1	**Results**	**Method**	**Sample ID 1504150-01**	**Results**	**Method**
Benzene	5700 ug/L	EPA 8260B	Benzene	4050 ug/L	SW846 6010B
Toluene	5600 ug/L	EPA 8260B	Toluene	5990 ug/L	SW846 6010B
Ethylbenzene	310 ug/L	EPA 8260B	Ethylbenzene	357 ug/L	SW846 6010B
m,p-Xylene	1500 ug/L	EPA 8260B	m,p-Xylene	1980 ug/L	SW846 6010B
o-Xylene	660 ug/L	EPA 8260B	o-Xylene	791 ug/L	SW846 6010B

3.4.4 Total Petroleum Hydrocarbons

The April 14, 2015 sample was tested for Total Petroleum Hydrocarbons (TPH) by EPA Method 1664 with a result of 41 mg/L. On June 4, 2015 a sample was tested for TPH by EPA Method 8015B with a result of 33.1 Diesel Range Organics, 18.0 Gasoline Range Organics and 32.9 Motor Oil.[3]

3.4.5 Polynuclear Aromatic Hydrocarbons

Table 4 presents results for Polynuclear Aromatic Hydrocarbons (PAHs).

Table 4 Polynuclear Aromatic Hydrocarbons

Sample Date: January 8, 2015			Sample Date: April 14, 2015		
Sample ID ZJJ150108-1	**Results**	**Method**	**Sample ID 1504150-01**	**Results**	**Method**
Ideno(1,2,3-cd)pyrene	Not Tested		Ideno(1,2,3-cd)pyrene	<10.0 ug/L	SW846 8270C
Naphthalene	290 ug/L	EPA 8260B	Naphthalene	123 ug/L	SW846 8270C
Acenaphthylene	Not Tested		Acenaphthylene	<10.0 ug/L	SW846 8270C
Acenaphthene	Not Tested		Acenaphthene	<10.0 ug/L	SW846 8270C
Fluorene	Not Tested		Fluorene	5.9 ug/L	SW846 8270C
Phenanthrene	Not Tested		Phenanthrene	10.4 ug/L	SW846 8270C
Anthracene	Not Tested		Anthracene	<10.0 ug/L	SW846 8270C

[3] Zalco Laboratories confirmed with CVRWQCB that this method used to determine TPH as crude oil standard is appropriate.

Fluoranthene	Not Tested		Fluoranthene	<10.0 ug/L	SW846 8270C
Pyrene	Not Tested		Pyrene	<10.0 ug/L	SW846 8270C
Benzo (a) anthracene	Not Tested		Benzo (a) anthracene	<10.0 ug/L	SW846 8270C
Chrysene	Not Tested		Chrysene	<10.0 ug/L	SW846 8270C
Benzo (b) fluoranthene	Not Tested		Benzo (b) fluoranthene	<10.0 ug/L	SW846 8270C
Benzo (k) fluoranthene	Not Tested		Benzo (k) fluoranthene	<10.0 ug/L	SW846 8270C
Benzo (a) pyrene	Not Tested		Benzo (a) pyrene	<10.0 ug/L	SW846 8270C
Dibenz (a,h) anthracene	Not Tested		Dibenz (a,h) anthracene	<10.0 ug/L	SW846 8270C
Benzo (g,h,i) perylene	Not Tested		Benzo (g,h,i) perylene	<10.0 ug/L	SW846 8270C

3.4.6 Radionuclides

Table 5 presents results for the radionuclides listed under California Code of Regulations, Title 22, Table 64442 for the Asphalto sump sample collected April 14, 2015.

Table 5 Radionuclides

Sample Date: April 14, 2015

Sample ID 1504150-01	
Radionuclide	**MCL**
Radium-226	<3.00 pCi/L
Radium-228	<2.00 pCi/L
Gross Alpha	133 pCi/L
Uranium	<20 pCi/L

3.4.7 Cations, Anions and Trace Elements

Table 6 presents results for Cations and Anions and Table 7 presents results for Trace Elements for the two samples.

Table 6 Cations and Anions

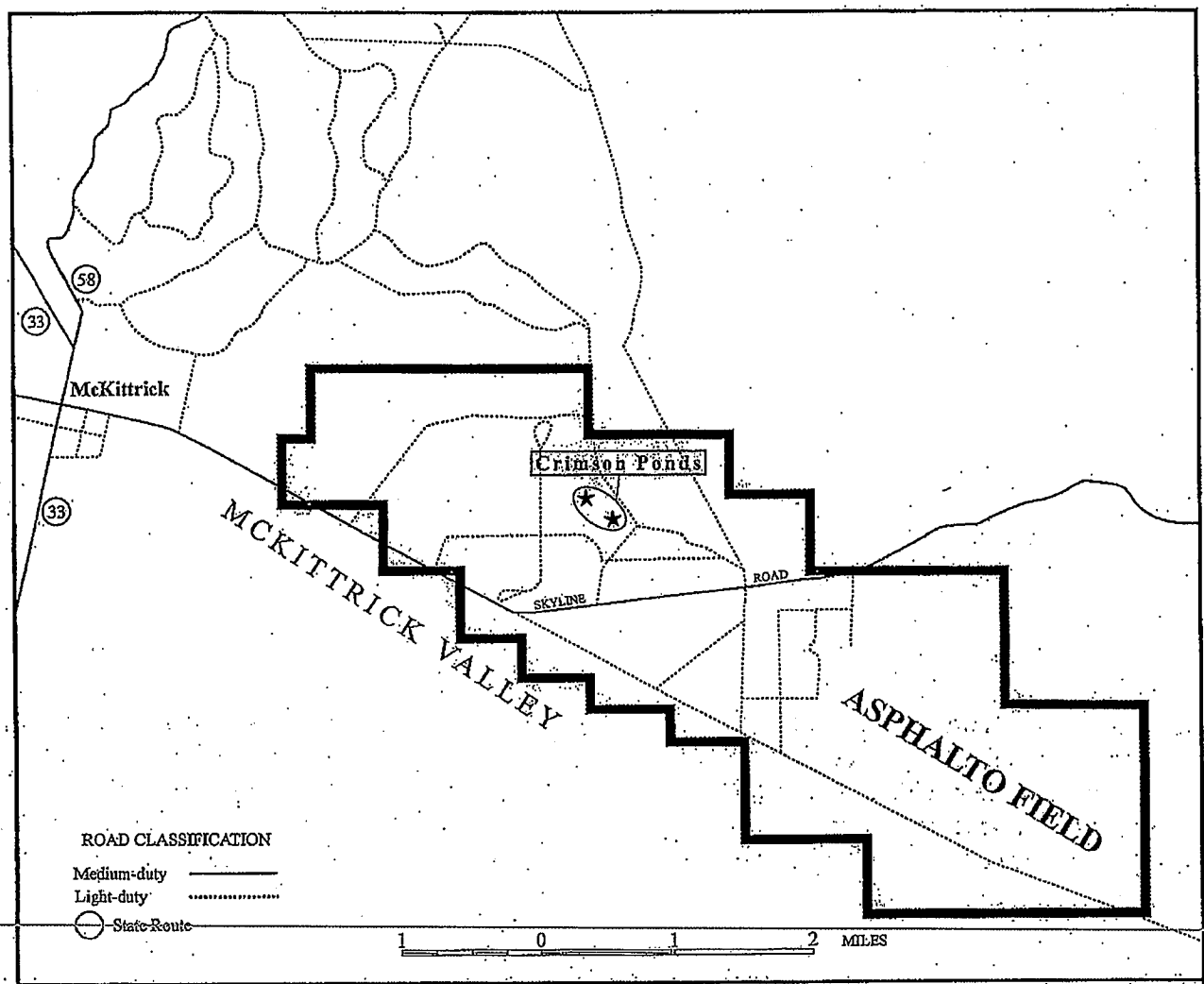
Sample Date: January 8, 2015				Sample Date: April 14, 2015		
Sample ID ZJJ150108-1	**Results**	**Method**		**Sample ID 1504150-01**	**Results**	**Method**
Calcium	47 mg/L	EPA 200.7		Calcium	34 mg/L	EPA 200.7
Magnesium	24 mg/L	EPA 200.7		Magnesium	28 mg/L	EPA 200.7
Potassium	100 mg/L	EPA 200.7		Potassium	88 mg/L	EPA 200.7
Sodium	12000 mg/L	EPA 200.7		Sodium	16000 mg/L	EPA 200.7
Chloride	18000 mg/L	EPA 300		Chloride	21000 mg/L	EPA 300
Sulfate (SO4)	48 mg/L	EPA 300		Sulfate (SO4)	<5.0 mg/L	EPA 300
Nitrate (NO3)	4.7 mg/L	EPA 300		Nitrate (NO3)	<2000 mg/L	EPA 300
Bicarbonate (HCO3)	5100 mg/L	SM2320B		Bicarbonate (HCO3)	3900 mg/L	SM2320B
Carbonate (CO3)	ND	SM2320B		Carbonate (CO3)	<10 mg/L	SM2320B
Bromide	Not Tested			Bromide	Not Tested	

Table 7 Trace Elements

Sample Date: January 8, 2015				Sample Date: April 14, 2015		
Sample ID ZJJ150108-1	**Results**	**Method**		**Sample ID 1504150-01**	**Results**	**Method**
Lithium	Not Tested			Lithium	3.3 mg/L	EPA 200.7
Strontium	Not Tested			Strontium	14 mg/L	EPA 200.7
Boron	150 mg/L	EPA 200.7		Boron	160 mg/L	EPA 200.7
Iron	0.44 mg/L	EPA 200.7		Iron	<1.0 mg/L	EPA 200.7
Manganese	0.0033 mg/L	EPA 200.8		Manganese	<0.30 mg/L	EPA 200.7

FIGURE 1

Site Location Map



GENERAL LOCATION MAP

Order Number R5-2004-0058

Waste Discharge Requirements
Crimson Resource Management Corp.
Asphalto Standard Lease
Asphalto Oil Field
Kern County

W ½ SW ¼ of Section 23, T30S, R22E, MDB&M
West Elk Hills 7.5 Minute USGS Quadrangle

N
W E
S

ATTACHMENT A

FIGURE 1

FIGURE 2

Lease Boundary Map

CRIMSON RESOURCE MANAGEMENT CORP.

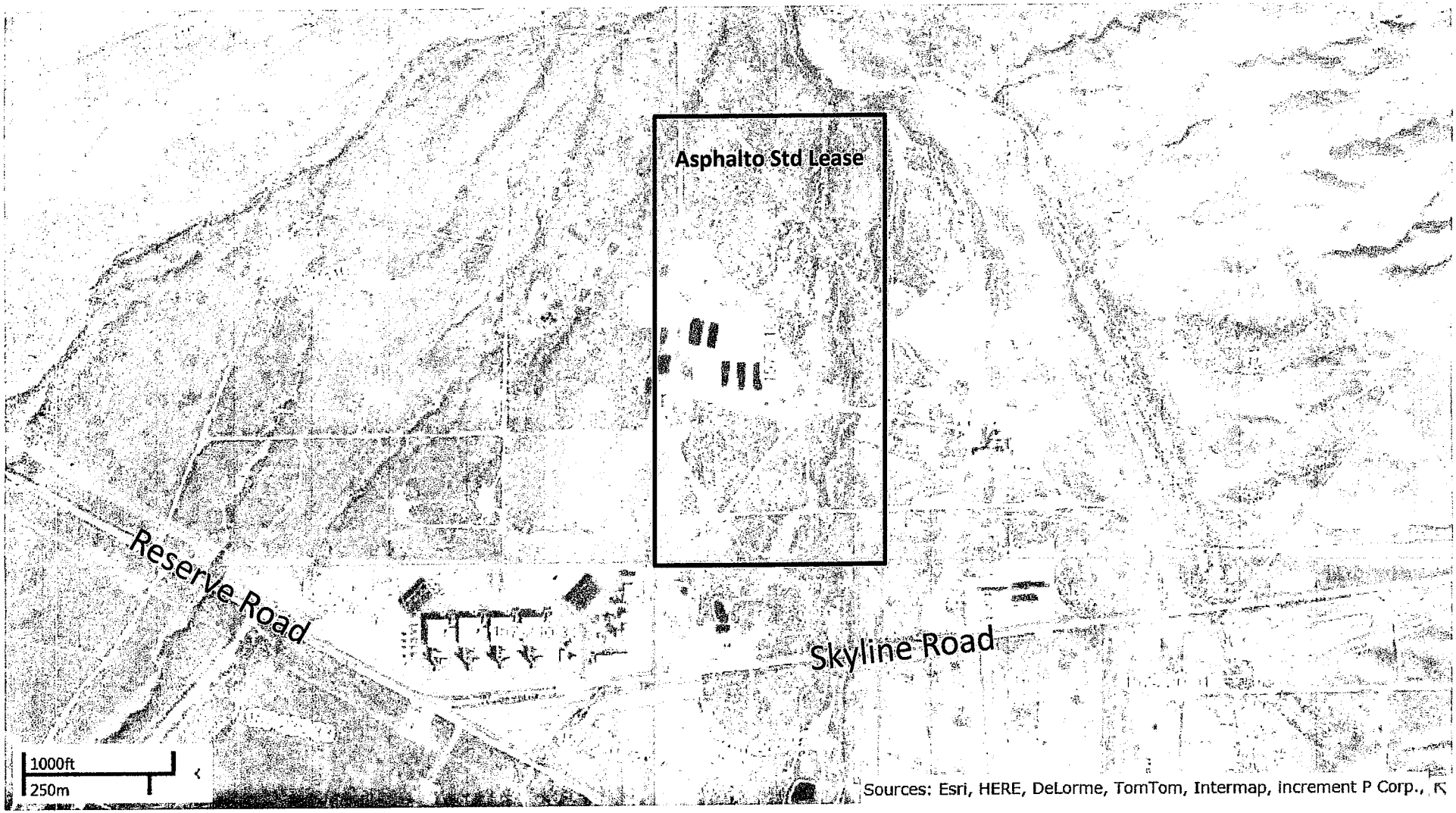
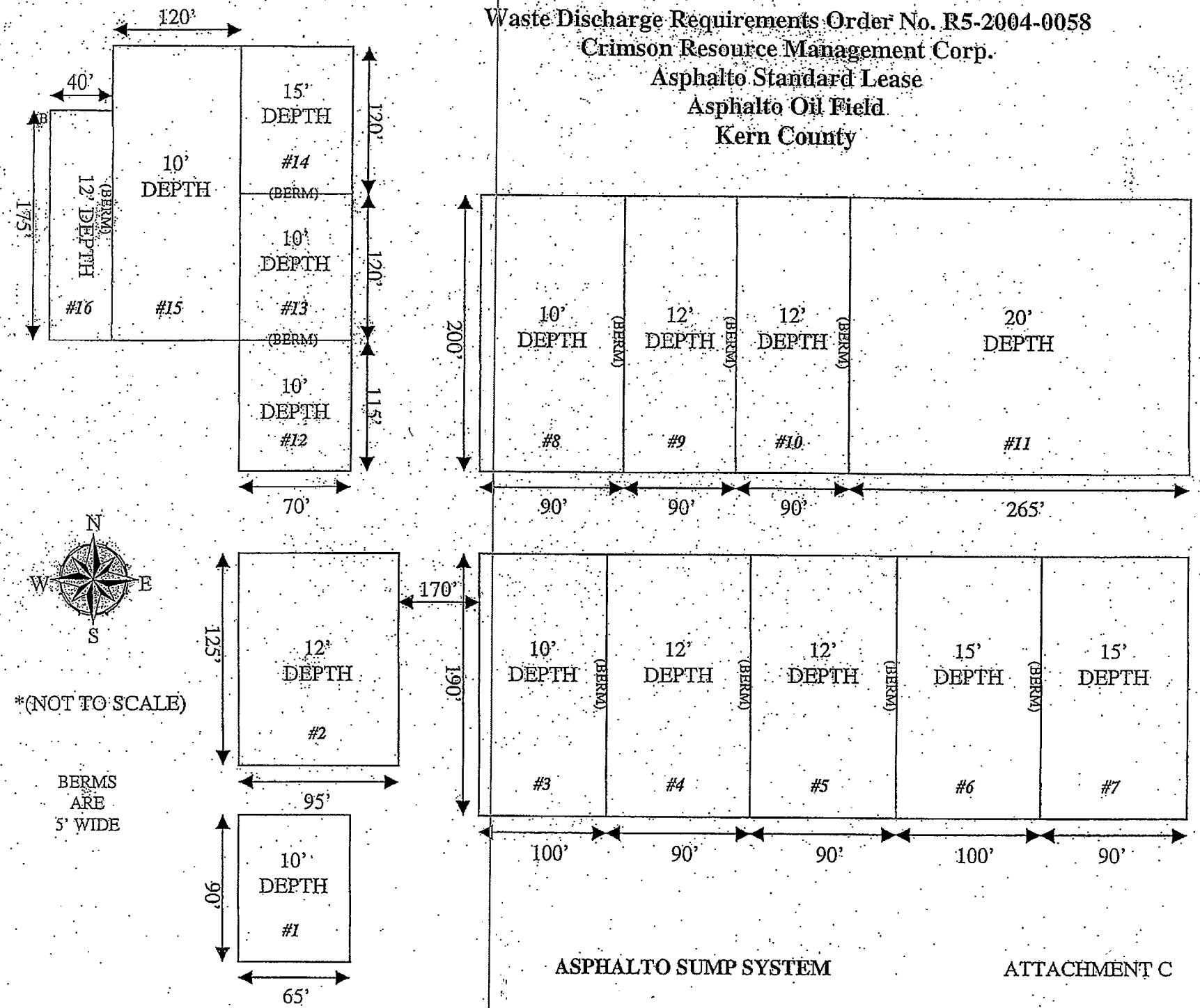


FIGURE 2

FIGURE 3

Asphalto Sump System

Waste Discharge Requirements Order No. R5-2004-0058
Crimson Resource Management Corp.
Asphalto Standard Lease
Asphalto Oil Field
Kern County



ASPHALTO SUMP SYSTEM

ATTACHMENT C

FIGURE 3

APPENDIX A

WDR Order No R5-2004-0058

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0058

WASTE DISCHARGE REQUIREMENTS
FOR
CRIMSON RESOURCE MANAGEMENT CORP.
ASPHALTO STANDARD LEASE
ASPHALTO OILFIELD
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. Crimson Resource Management Corp. (hereafter Discharger), a Colorado corporation, owns and operates crude oil production wells on the lease designated as "Asphalto Standard" in the Asphalto Oil Field within the McKittrick Valley. The Discharger is one of three within the oilfield.

2. The Discharger discharges to sixteen unlined surface impoundments (with approximate dimensions ranging from 65' x 90' to 200' x 265'), generally known in the industry as sumps. Approximately 1,200 barrels/day of produced wastewater are discharged to the sumps for disposal by solar evaporation and percolation.

3. The wastewater disposal operation is currently regulated by Waste Discharge Requirements (WDRs), Resolution No. 64-05001. The WDRs are being updated since they are no longer adequate or consistent with current State regulations and Regional Board policies and plans.

4. This Order implements the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition-1995* (hereafter Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.

LOCATION AND DESCRIPTION

5. The Discharger's facility is approximately two miles southeast of the unincorporated community of McKittrick, in the W ½ of the SW ¼, of Section 23, T30S, R22E, MDB&M, Assessor Parcel No. 157-210-05-00-9, as shown on Attachments A, B and C, that are attached to and made part of this Order. The Asphalto Oil Field, covers approximately four square miles within the McKittrick Valley, extending from near McKittrick at the northwest to approximately six miles southeast of McKittrick at the southeast end of the valley as shown on Attachments A, B and C.

6. The McKittrick Valley is a localized northwest-southeast structural trough formed by tectonic compressional forces associated with movement along the San Andreas Fault. McKittrick Valley is situated between the surficial features of the Elk Hills, McKittrick, Belgian Anticline and Buena Vista Hills oilfields where Pliocene-Pleistocene rocks crop out surrounding the valley. The trough contains over 10,000 feet of sedimentary deposits ranging in age from the Jurassic to Recent. The most recent sediments deposited in the valley trough are the 1,000+ foot thick Pleistocene Tulare Formation and the Quaternary Alluvium, which ranges up to 450 feet thick in the center of the valley.

7. The Tulare Formation, which lies stratigraphically below the Alluvium, consists of coarse-grained beds of poorly sorted sands and gravel, and beds of clay, silt, and fine sand. It is not an oil producing formation in Asphalto Oil Field.

8. No known active faults occur on or near the facility. The nearest known active faults are the Buena Vista Fault and the San Andreas Fault, which are approximately eleven miles southeast and ten miles southwest of the facility, respectively.

9. Land within the immediate area is used for oil exploration and production.

10. The discharge occurs in the Antelope Plain Hydrologic Area (No. 558.60), as depicted on interagency hydrologic maps prepared by the Department of Water Resources (DWR) in August 1986.

11. The climate in McKittrick Valley is semi-arid, with hot, dry summers and cool winters. Available weather data from a monitoring station in Taft (13-miles south) indicates the average annual precipitation is 5.6 inches and the average annual Class A pan evaporation is 95.7 inches.

12. The 100-year and 1000-year, 24-hour precipitation events calculated by DWR are 2.03 and 2.63 inches, respectively.

13. Small, unnamed drainage courses traverse the area in the vicinity of the facility. Some surface flow can be observed in the drainage courses following infrequent storm events during the months of November through April.

14. Flood Insurance Rate Map, Community Parcel Number 060075 950 B, dated 29 September 1986, indicates that the facility is not within a 100-year flood plain.

GROUNDWATER INFORMATION

15. The Basin Plan designates beneficial uses for groundwater in this region of the Tulare Lake Basin as municipal, agricultural, and industrial supply.

16. The West Kern Water District supplies domestic and industrial water to a 250 square mile area in western Kern County, including the McKittrick Valley area, from groundwater wells in the Tupman area. Other sources of water supply include State Water project deliveries and agreements with various Kern County water agencies. There are no other known alternative water supplies. There is no record of groundwater wells within 17 miles of the facility.

17. Pursuant to 40 Code of Federal Regulation (40 CFR), Section 146.4, the Tulare Formation in the Asphalto Oil Field has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons. The California State Division of Oil, Gas & Geothermal Resources is the permitting authority for Class II injection wells used for the subsurface injection of produced oilfield wastewater.

18. A detailed hydrogeologic study was conducted for the McKittrick Valley area. Technical information was developed during the study characterizing the hydrogeologic conditions in the area including the Discharger's facility. Results of the study demonstrate the absence of groundwater within the Alluvium in the McKittrick Valley. Both the Alluvium and Upper Tulare are geologically isolated from usable groundwater in the San Joaquin Valley to the east.

19. The Alluvium, approximately 350 feet thick, consists of poorly sorted, unconsolidated silt and clay with lenticular sand and gravel deposits chiefly derived from coalescing alluvial fans. The alluvial section is underlain throughout the valley, by an approximately 62-foot thick, laterally continuous, basal alluvial clay. Review of the geophysical logs indicates that the base of the upper alluvial sediments dip inward, in an elongated and continuous basin-like structure near the center of the McKittrick Valley.

20. The uppermost groundwater occurs nearly 200 feet below the basal alluvial clay, in a confined sand within the Upper Tulare, approximately 545 feet below ground surface. The groundwater is of poor quality, with a Total Dissolved Solids concentration of greater than 6,200 mg/L and a boron concentration greater than 10 mg/L.

21. The following is a summary of groundwater conditions in the area: 1) groundwater of limited aereal extent occurs in the Upper Tulare formation beneath the Asphalto Oil Field; 2) the groundwater occurs at a depth of over 500-feet; 3) is of poor quality with Total Dissolved Solids of greater than 6,200 mg/L and a boron concentration greater than 10 mg/L; 5) it has no identified existing beneficial uses; 6) it is geologically isolated from usable groundwater in the south San Joaquin Valley; and 7) it is not currently used, or likely to be used in the foreseeable future, and without extensive treatment, is not suitable for municipal or domestic supply.

22. Based on Finding Nos. 15-21, there is no groundwater in the area of the discharge that can reasonably be expected to be used for municipal, agricultural, or industrial supply.

WASTEWATER CHARACTERISTICS

23. Connate formation water (wastewater) is co-produced in association with crude oil, primarily from hydrocarbon bearing marine formations in the Asphalto Oil Field by the oilfield operators. The wastewater at the Discharger's facility is a sodium-chloride type having a high inorganic salt content. Benzene, including toluene, ethylbenzene and xylene (BTEX) can be naturally occurring in the light fraction of crude oils. Analytical results show that the wastewater has the following approximate range of characteristics:

Constituent	Range of Concentrations
Total Dissolved Solids (TDS) (mg/L)	20,000 - 30,000
Electrical conductivity (EC) (μmhos/cm)	40,000 – 60,000
Chloride (mg/L)	13,000 - 17,000
Constituent	Range of Concentrations

Boron (mg/L)	100 – 250
Benzene (µg/L)	N/D to 25
Toluene, ethylbenzene, and xylene (µg/L)	N/D to 20

POLICY & REGULATIONS

24. Implementation policies in the Basin Plan regarding the disposal of oilfield wastewater indicate that the maximum salinity limits for wastewater in unlined sumps overlying groundwater with existing and future probable beneficial uses are: 1,000 µmhos/cm electrical conductivity (EC), 200 mg/L chloride, and 1 mg/L boron. Discharges to unlined sumps may be permitted if the Discharger successfully demonstrates to the Regional Board in a public hearing that exceeding the maximum salinity limits will not substantially affect water quality nor cause a violation of water quality objectives.

25. The Basin Plan policy noted in Finding No. 24 was adopted to allow the Regional Board the flexibility to consider the beneficial reuse of some wastewater having salinities slightly above the maximum numerical limitations. The reuses included agricultural supply, stock watering and wildlife habitat enhancement. Based on the water quality at this facility, the Discharger does not propose to reuse the wastewater.

26. The "Sources of Drinking Water" policy, which was added to the Basin Plan in 1988, provides that all groundwater in the Tulare Lake Basin is considered to be suitable or potentially suitable for municipal or domestic water supply, and should be so designated by the Regional Board with certain exceptions. One of those exceptions is for groundwater that exceeds 3,000 mg/L in TDS (5,000 µmhos/cm EC), and is not reasonably expected to supply a public water system. A second exception is as stated in Finding No. 17, where pursuant to 40 CFR, Section 146.4, the Tulare Formation has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons.

27. Generally, designated waste is non-hazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan. The discharge of designated waste to land is subject to the requirements of Title 27, California Code of Regulations (CCR), Section 20090(b) (hereafter Title 27).

28. The Discharger is exempt from the requirements of Title 27. The exemption is based upon the following:

    a) The Regional Board is issuing waste discharge requirements;

    b) The wastewater discharge, as permitted in the Order, is in compliance with the applicable water quality control plan; and,

c) The wastewater does not need to be managed according to Chapter 11, Division 4.5 of Title 22 as a hazardous waste.

OTHER LEGAL REFERENCES

29. The action to adopt waste discharge requirements for existing facilities is exempt from the provisions of the California Environmental Quality Act (CEQA), in accordance with Title 14, CCR, Section 15301.

30. This Order requires the Discharger to submit technical reports as authorized under California Water Code (CWC) Section 13267 (b)(1), which states in part:

"In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region that could affect the quality of water within its region, shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."

31. The technical reports required by this Order and attached "Monitoring and Reporting Program No. R5-2004-0058, are necessary to assure compliance with these Waste Discharge Requirements. The Discharger operates the facility that discharges the waste subject to this Order.

32. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) general industrial stormwater permit provided it has not experienced a reportable spill since 19 November 1987. It is the Discharger's responsibility to comply with USEPA federal stormwater regulations (40 CFR Parts 122,123, and 124) should it not qualify for exemption.

33. The Regional Board has notified the Discharger, interested agencies, and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

34. The Regional Board, in a public meeting, heard and considered all comments pertaining to this facility and discharge.

35. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources

Control Board, Office of Chief Counsel, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.swrcb.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED that Resolution No. 64-05001 be rescinded, and that pursuant to §13263 and §13267 of the California Water Code, Crimson Resource Management Corp., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and plans, policies, and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. The acceptance, treatment, or discharge of "hazardous waste" is prohibited. For the purposes of this Order, the term "hazardous waste" is as defined in Title 27, Section 20164.

2. Discharges to surface water or surface water drainage courses are prohibited except for stormwater discharges permitted by an active NPDES permit or for discharge from facilities exempt from the NPDES permitting requirements.

3. The discharge of wastes other than wastewater associated with the production of crude oil on this lease is prohibited.

B. Discharge Specifications

1. Wastewater shall only be discharged to and confined to the sumps described in Finding No. 2.

2. Wastewater production shall be controlled to the extent necessary to maintain consistent compliance with the terms of this Order.

3. Containment berms for the sumps shall be designed and maintained to prevent leakage, whether from erosion, slope failure, animal burrowing, or some other cause.

4. The sumps shall have sufficient freeboard to prevent overtopping as a result of heavy successive precipitation events, high velocity winds, and seismic shaking. **In no case shall there be less than two feet (measured vertically) of freeboard.**

5. Precipitation and drainage control system shall be designed, constructed, operated, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour precipitation conditions. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the sumps.

6. The sumps shall be free of oil or effectively netted to preclude entry of wildlife in accordance with Title 14, CCR, Section 1770 (b), (3).

7. All wastewater storage and disposal facilities shall be operated and maintained to prevent liquids, precipitates, and sludges from concentrating to hazardous levels.

8. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution as defined by the California Water Code, Section 13050.

C. Provisions

1. The Discharger shall comply with those applicable sections of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991, which are attached to and made part of this Order. To the extent that the Standard Provisions are inconsistent with any terms, conditions, or requirements in this Order, this Order shall govern.

2. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. The Discharger shall comply with Monitoring and Reporting Program No. R5-2004-0058, which is attached to and made part of this Order. Failing to furnish the reports by the specified deadlines or falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the Discharger.

3. The Discharger may be required to submit additional technical reports as directed by the Executive Officer.

4. The Discharger shall notify Regional Board staff in writing of any proposed change in ownership or responsibility for construction or operation of the facility. This notification shall be given **90 days** prior to the effective date of the change and shall be accompanied by an amended Report of Waste Discharge and any technical documents needed to demonstrate continued compliance with this Order. In the event of any change in ownership of the wastewater facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Regional Board office.

5. The Discharger shall maintain a copy of this Order and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel upon request.

6. The Discharger shall immediately notify Regional Board staff of any flooding, equipment failure, slope failure, or other change in site conditions, which could impair the integrity of waste containment facilities or precipitation and drainage control structures.

7. The Regional Board staff will review this Order periodically and will revise these requirements when necessary.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 April 2004.

THOMAS R. PINKOS, Executive Officer

CDH:cdh/rac

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0058
FOR
CRIMSON RESOURCE MANAGEMENT CORP.
ASPHALTO STANDARD LEASE
ASPHALTO OIL FIELD
KERN COUNTY

Compliance with this Monitoring and Reporting Program, and with the Standard Provisions and Reporting Requirements dated 1 March 1991, is ordered by Waste Discharge Requirements Order No. R5-2004-0058.

Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements, constitutes noncompliance with the Waste Discharge Requirements and the Water Code, which can result in the imposition of civil monetary liability.

A. REQUIRED REPORTS

Report		Due
1.	Wastewater Monitoring (Section C.1)	**Annually**[1]
2.	Facility Inspection (Section C.2)	**Annually**[1]

[1] The Annual Report is due by 1 May of each year and shall include all analytical results and measurements performed during the year, and the facility inspection results.

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required by appropriate sections of the Standard Provisions and Reporting Requirements. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the Waste Discharge Requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible.

C. MONITORING

1. Wastewater Monitoring

At least once annually, a representative sample for wastewater analysis shall be taken at the point of discharge into the sumps. If discharge is not occurring, a representative sample shall be taken from wastewater within the sump nearest the discharge point. Chemical analyses used in monitoring shall be performed as required by Water Code Section 13176, Health and Safety Code Section 100825. Minimum analytical requirements for waste discharged at the facility are as follows:

Parameter/Constituent	Analytical Method [1]	Reporting Units
Total Annual Flow	estimate	bbl or gal
Electrical Conductivity, EC @ 25°C	EPA 120.1	µmhos/cm
Total Dissolved Solids, (TDS)	SM 2540C	mg/L
Chloride	EPA 300.0	mg/L
Boron	EPA 200.7	mg/L
Benzene, Toluene, Ethylbenzene, and Xylene compounds	EPA 8260	µg/L

[1] Other approved analytical methods may be proposed if they provide equal or greater accuracy or precision.

2. Freeboard Inspection

The freeboard shall be monitored on the sumps to the nearest tenth of a foot. A permanent marker shall be placed in the sumps with calibration including the water level at maximum capacity and available freeboard (minimum of two feet). Freeboard observations/measurements shall be conducted and recorded twice monthly. Freeboard monitoring reports shall be submitted with the annual reports.

3. Facility Inspection

The Discharger shall inspect all surface impoundment and drainage facilities for damage annually and following any major storm event and report any damage within 24 hours. Necessary repairs shall be implemented as soon as practicable and the Discharger shall report any subsequent repairs within 30 days of completion. The results of inspections shall be summarized in the annual report.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

23 April 2004
(Date)

CDH:cdh/rac

INFORMATION SHEET

ORDER NO. R5-2004-0058
CRIMSON RESOURCE MANAGEMENT CORP.
ASPHALTO STANDARD LEASE
ASPHALTO OIL FIELD
KERN COUNTY

Crimson Resource Management Corp. (Discharger) is a Colorado corporation that owns and operates crude oil production wells at the Asphalto Standard Lease in the W ½ of the SW ¼ of Section 23, T30S, R22E, MDB&M, Asphalto Oil Field. The field is approximately four square miles in size and Crimson Resource Management Corp. is one of only three dischargers in the oil field. The facility is approximately two miles southeast of the unincorporated community of McKittrick. Approximately 1,200 barrels/day of wastewater is currently being discharged to unlined sumps at the lease for disposal by solar evaporation and percolation. The facility has been in operation since the early 1960's.

Wastewater discharged at the lease has been regulated by Waste Discharge Requirements (WDRs), Resolution No. 64-05001. The WDRs are outdated and no longer consistent with Regional Board policy and State regulations. To achieve compliance with current policy and regulations, the WDRs are being updated and will incorporate regional hydrogeologic information developed from recent studies conducted in McKittrick Valley, designate the facility classification, and incorporate a monitoring and reporting program.

The climate in McKittrick Valley is semi-arid, with hot, dry summers and cool winters. The average annual precipitation is 5.6 inches and the average annual Class A pan evaporation is 95.7 inches. The facility is not within a 100-year flood plain.

The McKittrick Valley is a localized northwest-southeast structural trough formed by tectonic forces associated with the San Andreas Fault. The valley trough contains over 10,000 feet of sedimentary deposits ranging in age from the Jurassic to Recent. The most recent sediments deposited in the valley trough are the 1,500+ foot thick Pleistocene Tulare Formation and the Quaternary Alluvium, which ranges up to 450 feet thick in the center of the valley. No known faults occur on or near the facility.

The Alluvium consists of unconsolidated silt and clay with interbedded sand and gravel deposits derived from coalescing alluvial fans. The alluvial section is underlain throughout the valley, by an approximately 62-foot thick, laterally continuous, basal alluvial clay. Review of the geophysical logs indicates that the base of the upper alluvial sediments dip inward resulting in an elongated and continuous basin-like structure near the center of the McKittrick Valley.

A detailed hydrogeologic study was conducted for the McKittrick Valley area. Technical information was developed during the study characterizing the hydrogeologic conditions in the area of the Discharger's facility. There is no evidence of groundwater within the alluvial section beneath Asphalto or the McKittrick Valley.

However, groundwater occurs within the Upper Tulare at a depth of over 500-feet or nearly 200-feet below the basal alluvial clay, in a confined sand within the Upper Tulare. The groundwater is of poor quality, with a Total Dissolved Solids (TDS) concentration of greater than 6,200 mg/L and boron concentrations of approximately 10 mg/L. This Upper Tulare groundwater has no demonstrated beneficial uses, is isolated from usable groundwater in the south San Joaquin Valley, is not currently used or likely to be used in the foreseeable future, and is not suitable for municipal or domestic supply.

McKittrick Valley and Asphalto Oil Field are in an area where recent hydrogeological studies have been conducted to conclude that underlying poor quality groundwater has no beneficial uses and is isolated from usable groundwater to the east. There is no record of groundwater wells within 17 miles of the facility.

The West Kern Water District supplies domestic and industrial water to a 250 square mile area in western Kern County, including the McKittrick Valley area, from groundwater wells in the Tupman area. Other sources of water supply include State Water project deliveries and agreements with various Kern County water agencies.

Pursuant to 40 Code of Federal Regulation (40 CFR), Section 146.4, the Tulare Formation in the Asphalto Oil Field has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons. The California State Division of Oil, Gas & Geothermal Resources is the permitting authority for Class II injection wells used for the subsurface injection of produced oilfield wastewater.

Generally, designated waste is non-hazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan. The discharge of designated waste to land is subject to the requirements of Title 27, California Code of Regulations, Section 20090(b).

The Discharger is exempt from the requirements of Title 27 pursuant to Section 20090(b). The exemption is based upon: a) the Regional Board is issuing waste discharge requirements; 2) the wastewater discharge, as permitted in the Order, is in compliance with the applicable water quality control plan; and, c) the wastewater does not need to be managed according to Chapter 11, Division 4.5 of Title 22 as a hazardous waste.

The action to adopt WDRs for existing facilities is exempt from the provisions of the California Environmental Quality Act in accordance with Title 14, California Code of Regulations, Section 15301.

CDH:cdh/rac:4/23/2004

APPENDIX B

CVRWQCB Inspection Report
Dated April 3, 2015

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

RECEIVED
APR 0 6 2015
CRIMSON KERN

3 April 2015

Kristine Boyer
Crimson Resource Management
5001 California Avenue, Suite 206
Bakersfield, CA 93309

INSPECTION REPORT – CRIMSON RESOURCES MANAGEMENT, ASPHALTO STANDARD LEASE, ASPHALTO OIL FIELD, KERN COUNTY

Central Valley Regional Water Quality Control Board staff (Staff) inspected the Asphalto Standard Lease in the Asphalto Oil Field on 8 January 2015. Disposal operations at the facility are regulated by Waste Discharge Requirements Order R5-2004-0058 (WDRs). Staff's observations and comments are presented in the enclosed inspection report.

Sixteen surface impoundments (ponds) were observed on the lease, three of which were being used for the percolation and evaporation of oilfield production wastewater. Appropriate fencing and netting was in place and freeboard appeared to be adequate. A wastewater sample was collected. No violations of WDR's were observed.

The WDRs for this facility need to be updated. We will be issuing enforcement orders that will require collection of data needed to determine whether this facility can comply with current regulatory standards. We anticipate that an order for this facility will be issued by the end of calendar year 2015.

If you have any questions regarding this inspection, please contact Zachary Jarvie at (559) 445-5455 or by email at Zachary.Jarvie@waterboards.ca.gov.

Dane S. Johnson

DANE S. JOHNSON
Senior Engineering Geologist
Professional Geologist No. 4239

Enclosure: Inspection Report

cc: Mike Toland, CDOGGR, Bakersfield

5F	5D153215001		NA	1/4
OFFICE	WDID	**FACILITIES INSPECTION REPORT**	PROGRAM	PAGE NO.
R5-2004-0058	132937		9693	206572
ORDER NO.	REG MEASURE ID		PARTY ID	PLACE ID

CRIMSON RESOURCE MANAGEMENT	ASPHALTO OIL FIELD, ASPHALTO STANDARD LEASE
DISCHARGER NAME	FACILITY NAME
5001 CALIFORNIA AVENUE, SUITE 206	SW ¼ of SECTION 23, T30S, R22E, MDB&M
STREET ADDRESS	STREET ADDRESS
BAKERSFIELD, CA 93309	MCKITTRICK
CITY, STATE, ZIP CODE	CITY, STATE, ZIP CODE
KRISTINE BOYER	KRISTINE BOYER
DISCHARGER CONTACT PERSON	FACILITY CONTACT PERSON
(661) 343-3205	(661) 343-3205
TELEPHONE NO.	TELEPHONE NO.
E-MAIL ADDRESS	E-MAIL ADDRESS

GENERAL INSPECTION INFORMATION

Inspection Type: A Type Compliance Inspection — Lead Inspector: Zachary Jarvie

01/08/2015 to 01/08/2015	08:00AM - 9:30AM	Clear and sunny
INSPECTION DATE(S)	INSPECTION TIME	GENERAL WEATHER CONDITIONS

INSPECTION ATTENDEE(S)

NAME	COMPANY/AGENCY	TELEPHONE NO.	E-MAIL ADDRESS
Zachary Jarvie	Regional Water Board	(559) 445-5455	zachary.jarvie@waterboards.ca.gov
Kristine Boyer	Crimson Resource Mngmt.	(661) 343-3205	

INSPECTION SUMMARY (for CIWQS entry – 500 character maximum)

The Asphalto Standard Lease in the Asphalto Oil Field was inspected to ascertain the status of seven surface impoundments (ponds) identified by the California Division of Oil, Gas, and Geothermal Resources (DOGGR) as active as well as nine surface impoundments (ponds) identified by DOGGR as inactive.

All sixteen ponds were inspected. No violations of the Waste Discharge Requirements Order R5-2004-0058 (WDRs) were observed.

INSPECTION VIOLATIONS SUMMARY (if applicable)

Identify VIOLATIONS noted during inspection in table below. For each violation documented entered into CIWQS, identify Violation ID and Violation Type, describe violation, and identify section of the WDRs or Water Code violated.

Label	Violation ID	Violation Type	Violation Description	Section of the WDRs Violated
V1				
V2				
V3				
V4				
V5				
V6				

OTHER VIOLATIONS (if applicable)

SMR violations?	☐ Yes ☒ No ☐ Not Evaluated	Notes:
File Review violations?	☐ Yes ☒ No ☐ Not Evaluated	Notes:

Lead Inspector ID: 549144 Signature: Z Jarvie Date: 4/3/2015

Inspection Tracking Information Reviewed by: (1) _____ (2) _____ (3) _____

CIWQS Coordinator

Filename: CRIMSON RESOURCE MANAGEMENT ASPHALTO STANDARD LEASE, ASPHALTO CIWQS Entry Date: 01/30/2015 CIWQS Inspection ID: 19255101

FACILITIES INSPECTION REPORT
CRIMSON REASOURCES MANAGMENT
ASPHALTO STANDARD LEASE, ASPHALTO OIL FIELD

FACILITY INFORMATION

Oil and water production
FACILITY DESCRIPTION (e.g., total area in acres, number of waste management units, etc.)

Active
STATUS (active, inactive, closed)

Oil field production wastewater (produced water).
WASTE TYPES

Oil/Gas Extraction
FACILITY CLASSIFICATION

Surface impoundments (ponds).
DISPOSAL DESCRIPTION (e.g., composting, landfill, surface impoundment, etc.)

BACKGROUND

The discharges of wastewater in the Asphalto Standard Lease in the Asphalto Oil Field are regulated under the Waste Discharge Requirements, Order R5-2004-0058. The facility was last inspected 25 June 2013.

INSPECTION GIS DATA

GIS Equipment used: _____ _____ _____ _____
MANUFACTURER MODEL SERIAL NO. DATUM

Description of Measured Point	Latitude	Longitude	Datum	Comments

INSPECTION OBSERVATIONS AND FINDINGS

Describe observations and findings and identify those that document and reference each violation listed in the Inspection Violations Summary table by identifying the cited violation number within parentheses following the observation/finding (e.g., Exposed waste on top deck (V1)).

The Asphalto Standard Lease in the Asphalto Oil Field was inspected to ascertain the status of seven surface impoundments (ponds) identified by the California Division of Oil, Gas, and Geothermal Resources (DOGGR) as active as well as nine surface impoundments (ponds) identified by DOGGR as inactive. Photos were taken to document observed conditions (See Page 4).

The Asphalto Standard Lease includes oil and water production equipment, and sixteen unlined ponds. Pond numbers in this inspection correspond to those within WDRs Order R5-2004-0058.

Ponds 1 & 2 contained wastewater. They were fenced and netted and appeared to have adequate freeboard.

Ponds 3, 4, 5, 6, & 7, & 11 were dry. They were surrounded with barbed wire fencing and had no netting.

Ponds 8, 9, & 10 contained some wastewater. Freeboard appeared to be adequate. They were surrounded with barbed wire fencing and had no netting. They contained no oil.

Pond 12 contained wastewater. It was fenced and netted. Freeboard appeared to be adequate.

Ponds 13 & 15 contained some wastewater. Freeboard appeared to be adequate. They were surrounded with barbed wire fencing and had no netting. They contained no oil.

Ponds 14 & 16 were dry. They were surrounded with barbed wire fencing and had no netting.

No violations of the Waste Discharge Requirements Order R5-2004-0058 (WDRs) were observed.

SAMPLING INFORMATION AND OBSERVATIONS

Were samples collected during the inspection? ☒ Yes ☐ No Are sample results included in report? ☒ Yes ☐ No

Did discharger collect split samples? ☐ Yes ☒ No

SAMPLE COLLECTION INFORMATION AND OBSERVATIONS

SAMPLE ID	SAMPLE DESCRIPTION/OBSERVATIONS	SAMPLE TIME (hours)	PHOTO NO.
ZJJ150108-1	Sample from wastewater tank	8:45	Photo 6

DISCUSSION OF SAMPLING RESULTS

Discuss sampling results (e.g., discuss whether sampling results show compliance with WDRs).

Field measurements of the sample showed a pH of 7.50 and a conductivity of 53.20mS at a fluid temperature of 50.0°C.

Analytical results for the sample are; 34000 mg/L Total Dissolved Solids
18000 mg/L Chloride
150 mg/L Boron

Complete analytical results for the sample are available in Attachment 1.

CONCLUSIONS

Summarize the conclusions of the inspection(s) below.

1. Production wastewater is actively being discharged to the surface impoundments (ponds).
2. The discharges of wastewater in the Asphalto Lease in the Asphalto Oil Field are regulated under the Waste Discharge Requirements found within Order R5-2004-0058.
3. No violations of the Waste Discharge Requirements found within Order R5-2004-0058 were observed.

Attachments Include: Attachment 1: Lab Report for Sample ZJJ150108-1

PHOTOGRAPHS

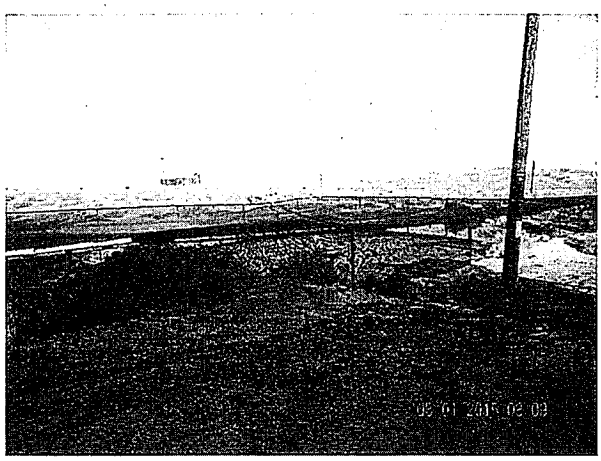


Photo 1. Pond 1 looking northwest

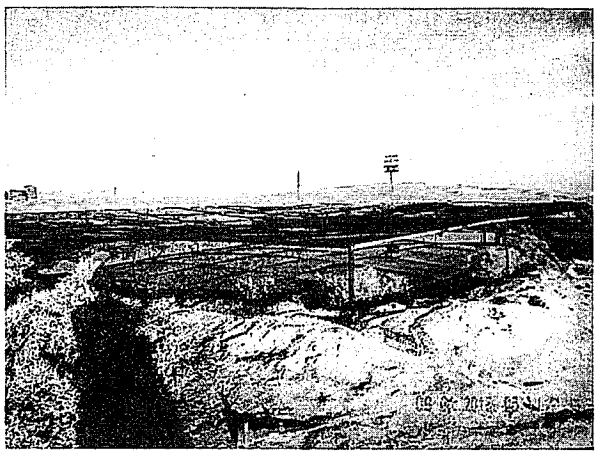


Photo 2. Pond 2 looking northwest

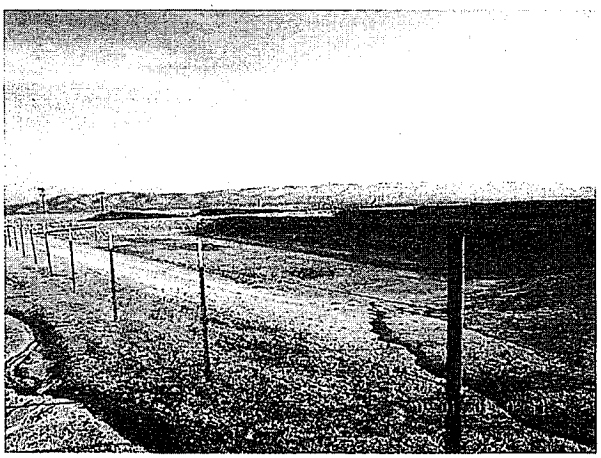


Photo 3. Pond 3 looking northeast

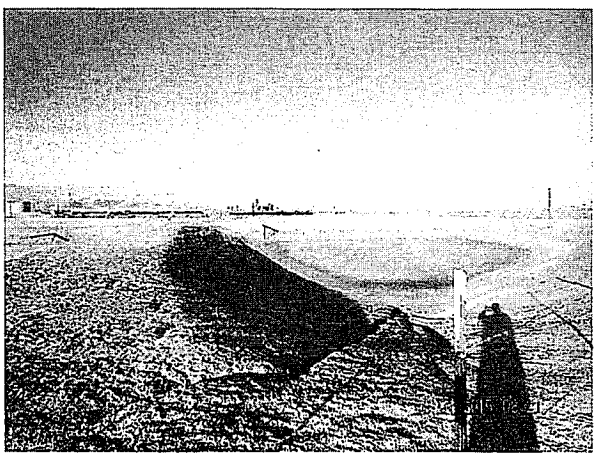


Photo 4. Pond 11 looking west

Photo 5. Pond 12 looking southeast

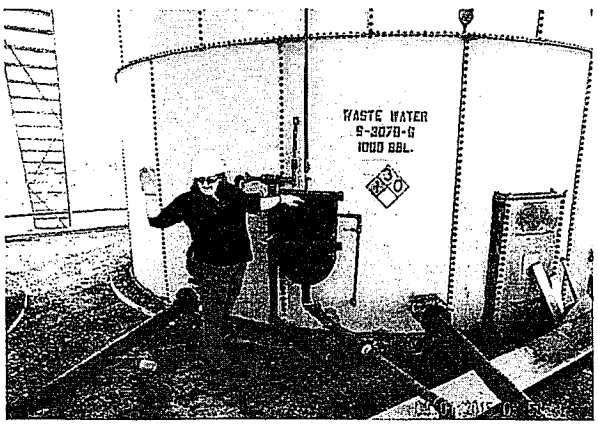


Photo 6. Sample location for ZJJ150801-1

Photos taken on 8 January 2015 by Zachary Jarvie, Engineering Geologist

Attachment 1

Lab Report for Sample ZJJ150801-1

MOORE TWINING ASSOCIATES, INC.

California ELAP Certificate #1371

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

January 29, 2015

Work Order #: BA09006

Anthony Toto
RWQCB - Fresno
1685 E Street
Fresno, CA 93706-2007

RE: 13-014-150

Enclosed are the analytical results for samples received by our laboratory on 01/09/15 . For your reference, these analyses have been assigned laboratory work order number BA09006.

All analyses have been performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, Moore Twining Associates, Inc. (MTA) is not responsible for use of less than complete reports. Results apply only to samples analyzed.

If you have any questions, please feel free to contact us at the number listed above.

Sincerely,

Moore Twining Associates, Inc.

Lisa Montijo

Lisa Montijo
Client Services Representative

MOORE TWINING ASSOCIATES, INC.

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
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California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
ZJJ150108-1	BA09006-01	Waste Water	01/08/15 08:45	01/09/15 08:40

MOORE TWINING

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California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

ZJJ150108-1

BA09006-01 (Waste Water) Sampled:01/08/15 08:45

Analyte	Flag	Result	Reporting Limit	MDL	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Method
Inorganics											
Total Alkalinity as CaCO3		4100	10	2.3	mg/L	10	U5A0922	CMG	1/9/15 17:12	1/13/15 0:09	SM2320B
Bicarbonate Alkalinity as HCO3		5100	13	2.3	mg/L	10	U5A0922	CMG	1/9/15 17:12	1/13/15 0:09	SM2320B
Carbonate Alkalinity as CO3		ND	10	2.3	mg/L	10	U5A0922	CMG	1/9/15 17:12	1/13/15 0:09	SM2320B
Hydroxide Alkalinity as OH		ND	10	2.3	mg/L	10	U5A0922	CMG	1/9/15 17:12	1/13/15 0:09	SM2320B
Cation/Anion Balance (% Difference)		5.7			%	1	U5A2709	JAA	1/27/15 11:00	1/27/15 11:01	CALC
Chloride		18000	400	3.7	mg/L	200	U5A0914	ETH	1/9/15 13:59	1/10/15 5:01	EPA 300.0
Hexavalent Chromium		130	100	26	µg/L	1	U5A1211	MVY	1/13/15 11:52	1/13/15 17:00	EPA 7196A
Specific Conductance (EC)		53000	1.0	0.26	µS/cm	1	U5A0922	CMG	1/9/15 17:12	1/9/15 19:42	SM2510B
Nitrate as NO3	J	4.7	200	1.8	mg/L	100	U5A0914	ETH	1/9/15 13:59	1/9/15 15:45	EPA 300.0
Nitrite as N		ND	30	1.1	mg/L	100	U5A0914	ETH	1/9/15 13:59	1/9/15 15:45	EPA 300.0
Orthophosphate as P		ND	25	0.28	mg/L	100	U5A0914	ETH	1/9/15 13:59	1/9/15 15:45	EPA 300.0
Sulfate as SO4	J	48	200	0.94	mg/L	100	U5A0914	ETH	1/9/15 13:59	1/9/15 15:45	EPA 300.0
Total Dissolved Solids		34000	200	160	mg/L	20	U5A0910	MVY	1/9/15 12:40	1/12/15 12:10	SM 2540C
Metals - Totals											
Antimony	J	1.3	10	0.68	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Arsenic		76	10	1.5	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Barium		21000	100	4.2	µg/L	100	U5A2321	JTN	1/26/15 7:35	1/28/15 12:45	EPA 200.8
Beryllium		ND	10	2.0	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Boron		150	6.2	0.10	mg/L	25	U5A1213	DAR	1/15/15 12:10	1/20/15 23:46	EPA 200.7
Cadmium		ND	2.0	0.79	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Calcium		47	0.50	0.038	mg/L	1	U5A1213	DAR	1/15/15 12:10	1/16/15 22:28	EPA 200.7
Chromium		ND	10	1.7	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Cobalt	J	1.0	10	0.24	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Copper		200	20	0.60	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Hardness		220	3.3		mg equiv. CaCO3/L	1	[CALC]	DAR	1/16/15 22:28	1/16/15 22:28	[CALC]
Iron	J	0.44	0.50	0.084	mg/L	1	U5A1213	DAR	1/15/15 12:10	1/16/15 22:28	EPA 200.7
Lead		ND	10	0.29	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Magnesium		24	0.50	0.045	mg/L	1	U5A1213	DAR	1/15/15 12:10	1/16/15 22:28	EPA 200.7
Manganese	J	0.0033	0.025	0.00087	mg/L	1	U5A1213	DAR	1/15/15 12:10	1/16/15 22:28	EPA 200.7
Mercury	D2	ND	0.40	0.069	µg/L	1	U5A1305	JTN	1/15/15 7:10	1/15/15 14:53	EPA 7470A
Molybdenum	J	3.7	10	0.25	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Nickel		380	10	0.27	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Potassium		100	5.0	0.38	mg/L	1	U5A1213	DAR	1/15/15 12:10	1/16/15 22:28	EPA 200.7

Moore Twining Associates, Inc.

Juliane Adams, Director of Analytical Chemistry

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Fresno, CA 93721
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California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

ZJJ150108-1

BA09006-01 (Waste Water) Sampled:01/08/15 08:45

Analyte	Flag	Result	Reporting Limit	MDL	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Method
Metals - Totals											
Selenium		**250**	10	1.7	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Silver		ND	10	1.5	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Sodium		**12000**	120	32	mg/L	25	U5A1213	DAR	1/15/15 12:10	1/20/15 23:46	EPA 200.7
Thallium		ND	10	0.64	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Vanadium	J	**5.6**	10	2.1	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Zinc	J	7.7	50	0.60	µg/L	10	U5A2321	JTN	1/26/15 7:35	1/26/15 16:52	EPA 200.8
Volatile Organics											
Dichlorodifluoromethane (CFC-12)		ND	25	9.6	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Chloromethane		ND	25	8.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Vinyl chloride		ND	25	8.1	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Bromomethane		ND	50	16	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Chloroethane		ND	25	8.2	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,1-Dichloroethene		ND	25	6.8	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Carbon disulfide		ND	25	7.2	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Acrolein		ND	500	77	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Methylene chloride		ND	50	10	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
trans-1,2-Dichloroethene		ND	25	5.7	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Methyl tert-Butyl Ether (MTBE)		ND	50	18	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,1-Dichloroethane		ND	25	6.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Acrylonitrile		ND	250	150	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
cis-1,2-Dichloroethene		ND	25	7.6	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
2,2-Dichloropropane		ND	50	12	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Bromochloromethane		ND	25	10	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Chloroform		ND	25	7.1	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Carbon tetrachloride		ND	25	8.2	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,1,1-Trichloroethane (TCA)		ND	25	7.9	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,1-Dichloropropene		ND	25	5.8	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Benzene		**5700**	25	5.1	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2-Dichloroethane (1,2-DCA)		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Trichloroethene (TCE)		ND	25	8.7	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Dibromomethane		ND	25	6.8	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2-Dichloropropane		ND	25	5.2	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Bromodichloromethane		ND	25	6.4	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

ZJJ150108-1

BA09006-01 (Waste Water) Sampled:01/08/15 08:45

Analyte	Flag	Result	Reporting Limit	MDL	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Method
Volatile Organics											
cis-1,3-Dichloropropene		ND	25	5.7	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Toluene		**5600**	25	13	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
trans-1,3-Dichloropropene		ND	25	7.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Tetrachloroethene (PCE)		ND	25	5.8	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Dibromochloromethane		ND	25	5.7	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,3-Dichloropropane		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2-Dibromoethane (EDB)		ND	25	11	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Ethylbenzene		**310**	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Chlorobenzene		ND	25	5.2	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,1,1,2-Tetrachloroethane		ND	25	6.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
m,p-Xylene		**1500**	50	10	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
o-Xylene		**660**	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Bromoform		ND	50	6.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Isopropylbenzene	J	**32**	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Bromobenzene		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
n-Propylbenzene	J	**36**	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,3,5-Trimethylbenzene		**70**	25	5.6	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
2-Chlorotoluene		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2,3-Trichloropropane (123TCP)		ND	25	14	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
4-Chlorotoluene		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
tert-Butylbenzene		ND	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2,4-Trimethylbenzene		**290**	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
sec-Butylbenzene		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
p-Isopropyltoluene	J	**10**	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,3-Dichlorobenzene		ND	25	2.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,4-Dichlorobenzene		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
n-Butylbenzene		ND	25	6.4	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2-Dichlorobenzene		ND	25	5.8	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2-Dibromo-3-chloropropane (DBCP)		ND	250	19	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2,4-Trichlorobenzene		ND	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Hexachlorobutadiene		ND	50	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Naphthalene		**290**	25	7.6	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
1,2,3-Trichlorobenzene		ND	25	5.0	µg/L	50	U5A1220	DTH	1/12/15 11:00	1/12/15 19:51	EPA 8260B
Surrogate: 4-Bromofluorobenzene		*99.4 %*	*70-130*				*U5A1220*		1/12/15 11:00	1/12/15 19:51	*EPA 8260B*

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Juliane Adams, Director of Analytical Chemistry

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California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

ZJJ150108-1

BA09006-01 (Waste Water) Sampled:01/08/15 08:45

Analyte	Flag	Result	Reporting Limit	MDL	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Method
Volatile Organics											
Surrogate: Dibromofluoromethane		*113 %*	*70-130*				*U5A1220*		1/12/15 11:00	1/12/15 19:51	*EPA 8260B*
Surrogate: Toluene-d8		*105 %*	*70-130*				*U5A1220*		1/12/15 11:00	1/12/15 19:51	*EPA 8260B*

Notes and Definitions

MS3	Recovery for this analyte was biased low; associated blank spike recoveries are within range.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). Same as DNQ - Detected, but Not Quantified.
D2	Sample diluted due to high concentration(s) of non-target analyte(s).
ug/L	micrograms per liter (parts per billion concentration units)
mg/kg	milligrams per kilogram (parts per million concentration units)
mg/L	milligrams per Liter (parts per million concentration units)
ND	Analyte NOT DETECTED at or above the Minimum Detection Limit (MDL)
RPD	Relative Percent Difference

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Inorganics - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A0910 - SM 2540C										
Blank (U5A0910-BLK1)				Prepared: 01/09/15 Analyzed: 01/12/15						
Total Dissolved Solids	ND	10	mg/L							
LCS (U5A0910-BS1)				Prepared: 01/09/15 Analyzed: 01/12/15						
Total Dissolved Solids	243	10	mg/L	240		101	80-120		20	
LCS Dup (U5A0910-BSD1)				Prepared: 01/09/15 Analyzed: 01/12/15						
Total Dissolved Solids	242	10	mg/L	240		101	80-120	0.412	20	
Duplicate (U5A0910-DUP1)		Source: BA07022-01		Prepared: 01/09/15 Analyzed: 01/12/15						
Total Dissolved Solids	168	10	mg/L		166			1.19	20	
Duplicate (U5A0910-DUP2)		Source: BA07022-02		Prepared: 01/09/15 Analyzed: 01/12/15						
Total Dissolved Solids	5680	10	mg/L		5680			0.0264	20	
Batch U5A0914 - EPA 300.0										
Blank (U5A0914-BLK1)				Prepared & Analyzed: 01/09/15						
Orthophosphate as P	ND	0.25	mg/L							
Chloride	ND	2.0	mg/L							
Nitrite as N	ND	0.30	mg/L							
Nitrate as NO3	ND	2.0	mg/L							
Sulfate as SO4	0.0212	2.0	mg/L							J
LCS (U5A0914-BS1)				Prepared & Analyzed: 01/09/15						
Nitrite as N	5.05	0.30	mg/L	5.00		101	90-110		20	
Orthophosphate as P	5.10	0.25	mg/L	5.00		102	90-110		20	
Chloride	50.4	2.0	mg/L	50.0		101	90-110		20	
Nitrate as NO3	49.2	2.0	mg/L	50.0		98.4	90-110		20	
Sulfate as SO4	50.0	2.0	mg/L	50.0		99.9	90-110		20	
LCS Dup (U5A0914-BSD1)				Prepared & Analyzed: 01/09/15						
Orthophosphate as P	5.10	0.25	mg/L	5.00		102	90-110	0.129	20	
Nitrite as N	5.01	0.30	mg/L	5.00		100	90-110	0.897	20	
Chloride	49.8	2.0	mg/L	50.0		99.7	90-110	1.20	20	
Nitrate as NO3	48.9	2.0	mg/L	50.0		97.7	90-110	0.680	20	
Sulfate as SO4	49.3	2.0	mg/L	50.0		98.6	90-110	1.29	20	
Matrix Spike (U5A0914-MS1)		Source: BA09007-01		Prepared & Analyzed: 01/09/15						
Nitrite as N	309	18	mg/L	300	ND	103	80-120		20	
Chloride	7970	120	mg/L	3000	4690	109	48-147		15	

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RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Inorganics - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A0914 - EPA 300.0										
Matrix Spike (U5A0914-MS1)		**Source: BA09007-01**		Prepared & Analyzed: 01/09/15						
Orthophosphate as P	306	15	mg/L	300	6.16	100	80-120		20	
Nitrate as NO3	2950	120	mg/L	3000	4.71	98.1	70-130		20	
Sulfate as SO4	2960	120	mg/L	3000	18.5	98.1	70-130		20	
Matrix Spike Dup (U5A0914-MSD1)		**Source: BA09007-01**		Prepared & Analyzed: 01/09/15						
Nitrite as N	307	18	mg/L	300	ND	102	80-120	0.604	20	
Chloride	7890	120	mg/L	3000	4690	107	48-147	0.948	15	
Orthophosphate as P	306	15	mg/L	300	6.16	100	80-120	0.0568	20	
Nitrate as NO3	2930	120	mg/L	3000	4.71	97.5	70-130	0.609	20	
Sulfate as SO4	2940	120	mg/L	3000	18.5	97.3	70-130	0.858	20	
Batch U5A0922 - SM2510B										
Blank (U5A0922-BLK1)				Prepared & Analyzed: 01/09/15						
Specific Conductance (EC)	ND	1.0	µS/cm							
Total Alkalinity as CaCO3	0.310	1.0	mg/L							J
Bicarbonate Alkalinity as HCO3	0.380	1.3	mg/L							J
Carbonate Alkalinity as CO3	ND	1.0	mg/L							
Hydroxide Alkalinity as OH	ND	1.0	mg/L							
LCS (U5A0922-BS1)				Prepared & Analyzed: 01/09/15						
Specific Conductance (EC)	526	1.0	µS/cm	500		105	80-120		20	
LCS (U5A0922-BS3)				Prepared & Analyzed: 01/09/15						
Total Alkalinity as CaCO3	207	1.0	mg/L	250		82.9	80-120		20	
LCS Dup (U5A0922-BSD1)				Prepared & Analyzed: 01/09/15						
Specific Conductance (EC)	528	1.0	µS/cm	500		106	80-120	0.374	20	
LCS Dup (U5A0922-BSD3)				Prepared & Analyzed: 01/09/15						
Total Alkalinity as CaCO3	206	1.0	mg/L	250		82.4	80-120	0.576	20	
Duplicate (U5A0922-DUP1)		**Source: BA09006-01**		Prepared & Analyzed: 01/09/15						
Specific Conductance (EC)	53200	1.0	µS/cm		53100			0.170	20	
Total Alkalinity as CaCO3	4240	10	mg/L		4140			2.42	20	
Bicarbonate Alkalinity as HCO3	5180	13	mg/L		5050			2.43	20	
Carbonate Alkalinity as CO3	ND	10	mg/L		ND				20	
Hydroxide Alkalinity as OH	ND	10	mg/L		ND				20	
Duplicate (U5A0922-DUP2)		**Source: BA09022-01**		Prepared & Analyzed: 01/09/15						
Total Alkalinity as CaCO3	106	1.0	mg/L		107			0.721	20	

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Juliane Adams, Director of Analytical Chemistry

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RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Inorganics - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A0922 - SM2510B										
Duplicate (U5A0922-DUP2)		**Source: BA09022-01**		Prepared & Analyzed: 01/09/15						
Specific Conductance (EC)	276	1.0	µS/cm		277			0.358	20	
Bicarbonate Alkalinity as HCO3	130	1.3	mg/L		131			0.721	20	
Carbonate Alkalinity as CO3	ND	1.0	mg/L		ND				20	
Hydroxide Alkalinity as OH	ND	1.0	mg/L		ND				20	
Batch U5A1211 - EPA 7196A										
Blank (U5A1211-BLK1)				Prepared & Analyzed: 01/13/15						
Hexavalent Chromium	2.84	10	µg/L							J
LCS (U5A1211-BS1)				Prepared & Analyzed: 01/13/15						
Hexavalent Chromium	98.7	10	µg/L	100		98.7	80-120		20	
LCS Dup (U5A1211-BSD1)				Prepared & Analyzed: 01/13/15						
Hexavalent Chromium	97.4	10	µg/L	100		97.4	80-120	1.28	20	
Duplicate (U5A1211-DUP1)		**Source: BA09006-01**		Prepared & Analyzed: 01/13/15						
Hexavalent Chromium	129	100	µg/L		129			0.00	20	
Matrix Spike (U5A1211-MS1)		**Source: BA09007-01**		Prepared & Analyzed: 01/13/15						
Hexavalent Chromium	1000	100	µg/L	1000	167	83.2	80-120		20	
Matrix Spike Dup (U5A1211-MSD1)		**Source: BA09007-01**		Prepared & Analyzed: 01/13/15						
Hexavalent Chromium	987	100	µg/L	1000	167	82.0	80-120	1.27	20	

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Metals - Totals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A1213 - EPA 200.7										
Blank (U5A1213-BLK1)				Prepared: 01/15/15 Analyzed: 01/16/15						
Boron	0.00380	0.050	mg/L							J
Iron	ND	0.10	mg/L							
Sodium	ND	1.0	mg/L							
Calcium	0.0105	0.10	mg/L							J
Magnesium	ND	0.10	mg/L							
Potassium	0.172	1.0	mg/L							J
Manganese	0.000224	0.0050	mg/L							J
LCS (U5A1213-BS1)				Prepared: 01/15/15 Analyzed: 01/16/15						
Potassium	2.14	1.0	mg/L	2.00		107	85-115		20	
Iron	1.77	0.10	mg/L	2.00		88.7	85-115		20	
Sodium	2.10	1.0	mg/L	2.00		105	85-115		20	
Boron	0.921	0.050	mg/L	1.00		92.1	85-115		20	
Manganese	0.104	0.0050	mg/L	0.100		104	85-115		20	
Magnesium	1.84	0.10	mg/L	2.00		91.9	85-115		20	
Calcium	1.01	0.10	mg/L	1.00		101	85-115		20	
LCS Dup (U5A1213-BSD1)				Prepared: 01/15/15 Analyzed: 01/16/15						
Manganese	0.106	0.0050	mg/L	0.100		106	85-115	1.61	20	
Potassium	2.16	1.0	mg/L	2.00		108	85-115	0.986	20	
Iron	1.81	0.10	mg/L	2.00		90.4	85-115	1.91	20	
Calcium	1.03	0.10	mg/L	1.00		103	85-115	2.13	20	
Sodium	2.11	1.0	mg/L	2.00		105	85-115	0.304	20	
Magnesium	1.88	0.10	mg/L	2.00		93.9	85-115	2.16	20	
Boron	0.949	0.050	mg/L	1.00		94.9	85-115	3.05	20	
Matrix Spike (U5A1213-MS1)		**Source: BA09019-01**		Prepared: 01/15/15 Analyzed: 01/16/15						
Manganese	1.02	0.050	mg/L	1.00	ND	102	70-130		20	
Iron	17.7	1.0	mg/L	20.0	0.295	87.1	70-130		20	
Boron	9.63	0.50	mg/L	10.0	0.779	88.5	70-130		20	
Matrix Spike (U5A1213-MS2)		**Source: BA12035-03**		Prepared: 01/15/15 Analyzed: 01/17/15						
Boron	2.11	0.10	mg/L	2.00	0.177	96.4	70-130		20	
Iron	3.85	0.20	mg/L	4.00	0.0863	94.1	70-130		20	
Manganese	0.213	0.010	mg/L	0.200	0.0141	99.6	70-130		20	
Matrix Spike Dup (U5A1213-MSD1)		**Source: BA09019-01**		Prepared: 01/15/15 Analyzed: 01/16/15						
Iron	18.2	1.0	mg/L	20.0	0.295	89.4	70-130	2.67	20	

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Metals - Totals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A1213 - EPA 200.7										
Matrix Spike Dup (U5A1213-MSD1)		**Source: BA09019-01**		Prepared: 01/15/15 Analyzed: 01/16/15						
Boron	9.79	0.50	mg/L	10.0	0.779	90.1	70-130	1.63	20	
Manganese	1.06	0.050	mg/L	1.00	ND	106	70-130	2.96	20	
Matrix Spike Dup (U5A1213-MSD2)		**Source: BA12035-03**		Prepared: 01/15/15 Analyzed: 01/17/15						
Boron	2.17	0.10	mg/L	2.00	0.177	99.9	70-130	3.22	20	
Manganese	0.220	0.010	mg/L	0.200	0.0141	103	70-130	3.06	20	
Iron	3.96	0.20	mg/L	4.00	0.0863	96.8	70-130	2.81	20	
Batch U5A1305 - EPA 7470A										
Blank (U5A1305-BLK1)				Prepared & Analyzed: 01/15/15						
Mercury	ND	0.20	µg/L							
LCS (U5A1305-BS1)				Prepared & Analyzed: 01/15/15						
Mercury	5.34	0.20	µg/L	5.00		107	80-120		20	
LCS (U5A1305-BS2)				Prepared & Analyzed: 01/15/15						
Mercury	5.68	0.20	µg/L	5.00		114	80-120		20	
LCS Dup (U5A1305-BSD1)				Prepared & Analyzed: 01/15/15						
Mercury	5.36	0.20	µg/L	5.00		107	80-120	0.318	20	
LCS Dup (U5A1305-BSD2)				Prepared & Analyzed: 01/15/15						
Mercury	5.68	0.20	µg/L	5.00		114	80-120	0.00	20	
Matrix Spike (U5A1305-MS1)		**Source: BA02018-01**		Prepared & Analyzed: 01/15/15						
Mercury	101	6.0	µg/L	150	5.10	63.9	70-130		20	MS3
Matrix Spike Dup (U5A1305-MSD1)		**Source: BA02018-01**		Prepared & Analyzed: 01/15/15						
Mercury	103	6.0	µg/L	150	5.10	64.9	70-130	1.53	20	MS3
Batch U5A2321 - EPA 200.8										
Blank (U5A2321-BLK1)				Prepared & Analyzed: 01/26/15						
Antimony	ND	1.0	µg/L							
Selenium	ND	1.0	µg/L							
Arsenic	ND	1.0	µg/L							
Zinc	0.395	5.0	µg/L							J
Nickel	ND	1.0	µg/L							
Thallium	ND	1.0	µg/L							
Cadmium	ND	0.20	µg/L							

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Metals - Totals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A2321 - EPA 200.8										
Blank (U5A2321-BLK1)				Prepared & Analyzed: 01/26/15						
Copper	ND	2.0	µg/L							
Molybdenum	0.0344	1.0	µg/L							J
Cobalt	ND	1.0	µg/L							
Lead	ND	1.0	µg/L							
Silver	ND	1.0	µg/L							
Beryllium	ND	1.0	µg/L							
Chromium	0.219	1.0	µg/L							J
Vanadium	ND	1.0	µg/L							
LCS (U5A2321-BS1)				Prepared & Analyzed: 01/26/15						
Copper	51.1	2.0	µg/L	50.0		102	85-115		20	
Cobalt	51.7	1.0	µg/L	50.0		103	85-115		20	
Cadmium	51.1	0.20	µg/L	50.0		102	85-115		20	
Nickel	51.2	1.0	µg/L	50.0		102	85-115		20	
Thallium	50	1.0	µg/L	50.0		100	85-115		20	
Vanadium	54.1	1.0	µg/L	50.0		108	85-115		20	
Molybdenum	51.4	1.0	µg/L	50.0		103	85-115		20	
Chromium	52.9	1.0	µg/L	50.0		106	85-115		20	
Antimony	51.7	1.0	µg/L	50.0		103	85-115		20	
Zinc	50.4	5.0	µg/L	50.0		101	85-115		20	
Beryllium	47.5	1.0	µg/L	50.0		95.0	85-115		20	
Silver	51.3	1.0	µg/L	50.0		103	85-115		20	
Arsenic	52.0	1.0	µg/L	50.0		104	85-115		20	
Selenium	51.5	1.0	µg/L	50.0		103	85-115		20	
Lead	49.4	1.0	µg/L	50.0		98.8	85-115		20	
LCS Dup (U5A2321-BSD1)				Prepared & Analyzed: 01/26/15						
Selenium	52.8	1.0	µg/L	50.0		106	85-115	2.44	20	
Thallium	50	1.0	µg/L	50.0		99.8	85-115	0.128	20	
Zinc	51.1	5.0	µg/L	50.0		102	85-115	1.25	20	
Vanadium	53.7	1.0	µg/L	50.0		107	85-115	0.700	20	
Nickel	51.5	1.0	µg/L	50.0		103	85-115	0.653	20	
Cadmium	50.2	0.20	µg/L	50.0		100	85-115	1.75	20	
Molybdenum	50.2	1.0	µg/L	50.0		100	85-115	2.37	20	
Copper	52.1	2.0	µg/L	50.0		104	85-115	2.04	20	
Silver	50.0	1.0	µg/L	50.0		100	85-115	2.64	20	

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Metals - Totals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A2321 - EPA 200.8										
LCS Dup (U5A2321-BSD1)				Prepared & Analyzed: 01/26/15						
Cobalt	51.7	1.0	µg/L	50.0		103	85-115	0.0148	20	
Chromium	53.7	1.0	µg/L	50.0		107	85-115	1.37	20	
Beryllium	48.1	1.0	µg/L	50.0		96.3	85-115	1.36	20	
Antimony	50.4	1.0	µg/L	50.0		101	85-115	2.54	20	
Arsenic	52.3	1.0	µg/L	50.0		105	85-115	0.599	20	
Lead	49.5	1.0	µg/L	50.0		98.9	85-115	0.134	20	
Matrix Spike (U5A2321-MS1)		**Source: BA08024-01**		Prepared & Analyzed: 01/26/15						
Selenium	230	5.0	µg/L	250	ND	91.6	70-130		20	
Lead	240	5.0	µg/L	250	0.47	94.2	70-130		20	
Cadmium	230	1.0	µg/L	250	0.89	92.8	70-130		20	
Nickel	660	5.0	µg/L	250	440	90.7	70-130		20	
Zinc	340	25	µg/L	250	120	87.3	70-130		20	
Cobalt	260	5.0	µg/L	250	6.5	99.7	70-130		20	
Silver	231	5.0	µg/L	250	ND	92.4	70-130		20	
Barium	260	5.0	µg/L	250	5.6	100	70-130		20	
Antimony	270	5.0	µg/L	250	22	101	70-130		20	
Thallium	240	5.0	µg/L	250	ND	95.6	70-130		20	
Copper	270	10	µg/L	250	32	95.0	70-130		20	
Arsenic	260	5.0	µg/L	250	10	101	70-130		20	
Chromium	260	5.0	µg/L	250	2.5	104	70-130		20	
Beryllium	240	5.0	µg/L	250	ND	95.4	70-130		20	
Molybdenum	320	5.0	µg/L	250	42	111	70-130		20	
Vanadium	380	5.0	µg/L	250	110	106	70-130		20	
Matrix Spike (U5A2321-MS2)		**Source: BA13022-01**		Prepared & Analyzed: 01/26/15						
Lead	49	1.0	µg/L	50.0	0.45	97.8	70-130		20	
Barium	93	1.0	µg/L	50.0	40	105	70-130		20	
Arsenic	270	1.0	µg/L	50.0	220	105	70-130		20	
Beryllium	52	1.0	µg/L	50.0	ND	105	70-130		20	
Chromium	57	1.0	µg/L	50.0	2.5	110	70-130		20	
Copper	52	2.0	µg/L	50.0	2.1	99.1	70-130		20	
Molybdenum	55	1.0	µg/L	50.0	1.0	108	70-130		20	
Cadmium	50	0.20	µg/L	50.0	ND	99.8	70-130		20	
Nickel	90	1.0	µg/L	50.0	42	96.4	70-130		20	
Thallium	49	1.0	µg/L	50.0	ND	98.2	70-130		20	

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1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Metals - Totals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A2321 - EPA 200.8										
Matrix Spike (U5A2321-MS2)		**Source: BA13022-01**		Prepared & Analyzed: 01/26/15						
Vanadium	54	1.0	µg/L	50.0	0.89	106	70-130		20	
Zinc	51	5.0	µg/L	50.0	3.0	95.3	70-130		20	
Cobalt	52	1.0	µg/L	50.0	1.2	101	70-130		20	
Selenium	49	1.0	µg/L	50.0	0.36	96.3	70-130		20	
Silver	49.4	1.0	µg/L	50.0	ND	98.9	70-130		20	
Antimony	73	1.0	µg/L	50.0	21	105	70-130		20	
Matrix Spike Dup (U5A2321-MSD1)		**Source: BA08024-01**		Prepared & Analyzed: 01/26/15						
Vanadium	380	5.0	µg/L	250	110	107	70-130	0.660	20	
Zinc	340	25	µg/L	250	120	86.2	70-130	0.768	20	
Silver	229	5.0	µg/L	250	ND	91.4	70-130	1.05	20	
Thallium	240	5.0	µg/L	250	ND	96.1	70-130	0.532	20	
Selenium	230	5.0	µg/L	250	ND	92.0	70-130	0.487	20	
Nickel	660	5.0	µg/L	250	440	88.1	70-130	0.989	20	
Molybdenum	320	5.0	µg/L	250	42	112	70-130	0.786	20	
Cadmium	240	1.0	µg/L	250	0.89	93.9	70-130	1.14	20	
Copper	270	10	µg/L	250	32	96.0	70-130	0.935	20	
Cobalt	260	5.0	µg/L	250	6.5	99.9	70-130	0.202	20	
Chromium	260	5.0	µg/L	250	2.5	105	70-130	0.427	20	
Arsenic	260	5.0	µg/L	250	10	101	70-130	0.324	20	
Barium	260	5.0	µg/L	250	5.6	102	70-130	1.05	20	
Beryllium	240	5.0	µg/L	250	ND	97.0	70-130	1.68	20	
Lead	240	5.0	µg/L	250	0.47	95.7	70-130	1.53	20	
Antimony	280	5.0	µg/L	250	22	102	70-130	0.846	20	
Matrix Spike Dup (U5A2321-MSD2)		**Source: BA13022-01**		Prepared & Analyzed: 01/26/15						
Silver	48.2	1.0	µg/L	50.0	ND	96.5	70-130	2.46	20	
Nickel	90	1.0	µg/L	50.0	42	96.8	70-130	0.209	20	
Selenium	48	1.0	µg/L	50.0	0.36	95.2	70-130	1.12	20	
Thallium	49	1.0	µg/L	50.0	ND	98.5	70-130	0.258	20	
Barium	94	1.0	µg/L	50.0	40	107	70-130	1.38	20	
Cadmium	50	0.20	µg/L	50.0	ND	99.2	70-130	0.620	20	
Lead	49	1.0	µg/L	50.0	0.45	97.3	70-130	0.514	20	
Chromium	58	1.0	µg/L	50.0	2.5	112	70-130	1.89	20	
Zinc	51	5.0	µg/L	50.0	3.0	95.1	70-130	0.149	20	
Arsenic	260	1.0	µg/L	50.0	220	91.0	70-130	2.65	20	

Moore Twining Associates, Inc.

Juliane Adams, Director of Analytical Chemistry

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

MOORE TWINING

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Metals - Totals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A2321 - EPA 200.8										
Matrix Spike Dup (U5A2321-MSD2)		**Source: BA13022-01**		Prepared & Analyzed: 01/26/15						
Antimony	72	1.0	µg/L	50.0	21	101	70-130	2.43	20	
Vanadium	54	1.0	µg/L	50.0	0.89	107	70-130	0.583	20	
Molybdenum	54	1.0	µg/L	50.0	1.0	106	70-130	1.46	20	
Beryllium	52	1.0	µg/L	50.0	ND	105	70-130	0.292	20	
Copper	51	2.0	µg/L	50.0	2.1	98.2	70-130	0.846	20	
Cobalt	52	1.0	µg/L	50.0	1.2	102	70-130	0.856	20	

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MOORE TWINING ASSOCIATES, INC.

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(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Volatile Organics - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A1220 - EPA 8260B										
Blank (U5A1220-BLK1)			Prepared & Analyzed: 01/12/15							
Surrogate: 4-Bromofluorobenzene	*25.0*		*µg/L*	*25.0*		*99.8*	*70-130*			
Surrogate: Dibromofluoromethane	*26.0*		*µg/L*	*25.0*		*104*	*70-130*			
Surrogate: Toluene-d8	*25.5*		*µg/L*	*25.0*		*102*	*70-130*			
Dichlorodifluoromethane (CFC-12)	ND	0.50	µg/L							
Chloromethane	ND	0.50	µg/L							
Vinyl chloride	ND	0.50	µg/L							
Bromomethane	ND	1.0	µg/L							
Chloroethane	ND	0.50	µg/L							
1,1-Dichloroethene	ND	0.50	µg/L							
Carbon disulfide	ND	0.50	µg/L							
Acrolein	ND	10	µg/L							
Methylene chloride	ND	1.0	µg/L							
trans-1,2-Dichloroethene	ND	0.50	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							
1,1-Dichloroethane	ND	0.50	µg/L							
Acrylonitrile	ND	5.0	µg/L							
cis-1,2-Dichloroethene	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
Bromochloromethane	ND	0.50	µg/L							
Chloroform	ND	0.50	µg/L							
Carbon tetrachloride	ND	0.50	µg/L							
1,1,1-Trichloroethane (TCA)	ND	0.50	µg/L							
1,1-Dichloropropene	ND	0.50	µg/L							
Benzene	ND	0.50	µg/L							
1,2-Dichloroethane (1,2-DCA)	ND	0.50	µg/L							
Trichloroethene (TCE)	ND	0.50	µg/L							
Dibromomethane	ND	0.50	µg/L							
1,2-Dichloropropane	ND	0.50	µg/L							
Bromodichloromethane	ND	0.50	µg/L							
cis-1,3-Dichloropropene	ND	0.50	µg/L							
Toluene	ND	0.50	µg/L							
trans-1,3-Dichloropropene	ND	0.50	µg/L							
Tetrachloroethene (PCE)	ND	0.50	µg/L							
Dibromochloromethane	ND	0.50	µg/L							

MOORE TWINING

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California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Volatile Organics - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A1220 - EPA 8260B										
Blank (U5A1220-BLK1)			Prepared & Analyzed: 01/12/15							
1,3-Dichloropropane	ND	0.50	µg/L							
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Ethylbenzene	ND	0.50	µg/L							
Chlorobenzene	ND	0.50	µg/L							
1,1,1,2-Tetrachloroethane	ND	0.50	µg/L							
m,p-Xylene	ND	1.0	µg/L							
o-Xylene	ND	0.50	µg/L							
Bromoform	ND	1.0	µg/L							
Isopropylbenzene	ND	1.0	µg/L							
Bromobenzene	ND	0.50	µg/L							
n-Propylbenzene	ND	1.0	µg/L							
1,3,5-Trimethylbenzene	ND	0.50	µg/L							
2-Chlorotoluene	ND	0.50	µg/L							
1,2,3-Trichloropropane (123TCP)	ND	0.50	µg/L							
4-Chlorotoluene	ND	0.50	µg/L							
tert-Butylbenzene	ND	1.0	µg/L							
1,2,4-Trimethylbenzene	ND	1.0	µg/L							
sec-Butylbenzene	ND	0.50	µg/L							
p-Isopropyltoluene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	0.50	µg/L							
1,4-Dichlorobenzene	ND	0.50	µg/L							
n-Butylbenzene	ND	0.50	µg/L							
1,2-Dichlorobenzene	ND	0.50	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L							
1,2,4-Trichlorobenzene	ND	1.0	µg/L							
Hexachlorobutadiene	ND	1.0	µg/L							
Naphthalene	ND	0.50	µg/L							
1,2,3-Trichlorobenzene	ND	0.50	µg/L							
LCS (U5A1220-BS1)			Prepared & Analyzed: 01/12/15							
Surrogate: 4-Bromofluorobenzene	*24.8*		*µg/L*	*25.0*		*99.4*	*70-130*			
Surrogate: Dibromofluoromethane	*25.9*		*µg/L*	*25.0*		*104*	*70-130*			
Surrogate: Toluene-d8	*25.6*		*µg/L*	*25.0*		*103*	*70-130*			
1,1-Dichloroethene	21.6	0.50	µg/L	19.8		109	70-130		20	
Benzene	20.2	0.50	µg/L	20.0		101	70-130		20	

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California ELAP Certificate #1371

RWQCB - Fresno	Project: 13-014-150	
1685 E Street	Project Number: 13-014-150	**Reported:**
Fresno CA, 93706-2007	Project Manager: Anthony Toto	1/29/2015

Volatile Organics - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch U5A1220 - EPA 8260B										
LCS (U5A1220-BS1)				Prepared & Analyzed: 01/12/15						
Trichloroethene (TCE)	18.7	0.50	µg/L	20.0		93.4	70-130		20	
Toluene	19.5	0.50	µg/L	19.9		98.0	70-130		20	
Chlorobenzene	19.3	0.50	µg/L	20.0		96.4	70-130		20	
LCS Dup (U5A1220-BSD1)				Prepared & Analyzed: 01/12/15						
Surrogate: 4-Bromofluorobenzene	*24.6*		*µg/L*	*25.0*		*98.4*	*70-130*			
Surrogate: Dibromofluoromethane	*27.0*		*µg/L*	*25.0*		*108*	*70-130*			
Surrogate: Toluene-d8	*25.6*		*µg/L*	*25.0*		*103*	*70-130*			
1,1-Dichloroethene	21.3	0.50	µg/L	19.8		107	70-130	1.59	20	
Benzene	20.2	0.50	µg/L	20.0		101	70-130	0.0496	20	
Trichloroethene (TCE)	17.7	0.50	µg/L	20.0		88.6	70-130	5.28	20	
Toluene	19.1	0.50	µg/L	19.9		95.8	70-130	2.33	20	
Chlorobenzene	19.0	0.50	µg/L	20.0		94.9	70-130	1.62	20	

MOORE TWINING ASSOCIATES, INC.

ANALYTICAL CHEMISTRY DIVISION
CALIFORNIA ELAP CERTIFICATION # 1371

CHAIN OF CUSTODY/ANALYSIS REQUEST

2527 FRESNO STREET • FRESNO, CA 93721 • PHONE (559) 268-7021 • FAX: (559) 268-0740

WORK ORDER #: BA09006
PAGE 1 **OF** 7

REPORT TO: ■ INVOICE TO: □ REPORT COPY TO:

REPORT TO	INVOICE TO
ATTENTION: Zachary Jarvie	ATTENTION: Anthony Toto
NAME: Regional Water Board	NAME: Regional Water Board
ADDRESS: 1685 E Street, Fresno, CA 93706	ADDRESS: 1685 E Street, Fresno, CA 93706
PHONE: 559-445-5455	PHONE: 559-445-6278
email: Zachary.Jarvie@waterboards.ca.gov	FAX: 559-445-5910

REPORTING:
- □ STANDARD FORMAT
- □ WRITE-ON (STATE FORM)
- □ GEOTRACKER/COELT (LUFT)
- □ PDF □ SPREADSHEET
- □ County DHS : _____
- □ Environmental Health Agency : _____
- □ OTHER: _____

SAMPLE INFORMATION

SAMPLED BY (PRINT): Zachary Jarvie
SIGNATURE:

□ PUBLIC SYSTEM □ ROUTINE
□ PRIVATE WELL □ REPEAT
□ OTHER □ REPLACEMENT

TURN AROUND TIME: □ RUSH, DUE ON:
□ STANDARD

SAMPLE TYPES:

SOLID:
BS – BIOSOLID
CR – CERAMIC
SL – SOIL/SOLID

LIQUID:
DW - DRINKING WATER
GW - GROUND WATER
OL - OIL
SF - SURFACE WATER
ST - STORM WATER
WW – WASTE WATER

PROJECT INFORMATION

CONTRACT/P.O. NO.: 13-014-150
PROJECT:
PROJECT NUMBER:
PROJECT MANAGER:

ANALYSIS REQUESTED

NOTES ON RECEIVED CONDITION:
□ CUSTODY SEAL(S) BROKEN □ SAMPLE(S) DAMAGED
□ ON ICE □ AMBIENT TEMP. □ INCORRECT PRESERVATION

LAB USE

	CLIENT SAMPLE ID	DATE	TIME	TYPE	General Minerals	VOC 8260 (w/BTEX)	Total Metals Title 22
1	ZJJ150108-1	Jan 8 2015	8:45 am	WW	X	X	X

COMMENTS/ADDITIONAL INSTRUCTIONS: Note: The air bubbles in the vials is due to the effervescent/fizzy nature of the sample

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY
Z Jarvie		1/9/15	840	MB	

Moore Twining Associates, Inc.

Sample Integrity Page 2 of 3 WO# B A09006 Date Received: 1/9/15

Section 1-Sampled Same Day

Sample Transport: Walk In MTA Courier Transported In: Ice Chest Box Hand

Has Chilling Begun? Yes No

Section 2-Sampled Previously

Sample Transport: Walk-in UPS GSO Fed Ex MTA Courier Other:

No. Coolers/Ice Chests: - Temperature(s): 4.3 C°

Was Temperature In Range: Y or N Received On Ice: Wet Blue

Describe type of packing materials: Bubble Wrap Foam Packing Peanuts Paper Other:

Were ice chest custody seals present? Y or N Intact? Y or N

Section 3-COC Info.

	Completed			Completed	
	Yes	No		Yes	No
Was COC Received	✓		Analysis Requested	✓	
Date Sampled	✓		Any hold times less than 72hr	✓	
Time Sampled	✓		Client Name	✓	
Sample ID	✓		Address	✓	
Special Storage/Handling Ins.		✓	Telephone #	✓	

Section 4-Bottles/Analysis

	Yes	No	N/A	Comment
Did all bottles arrive unbroken and intact?	✓			
Were bottle custody seals present?			-	
Were bottle custody seals intact?			✓	
Did all bottle labels agree with COC?	✓			
Were correct containers used for the tests requested?	✓			
Was sufficient amount of sample sent for tests indicated?	✓			
Were bubbles present in VOA Vials? (Volatiles Methods Only)			✓	
Were Ascorbic Acid Bottles Received with VOAs?			✓	

Section 5-Comment/Discrepancies

Sample(s) Split/Preserved: Yes or No Container: Preservation: Initials:

Filtered: Yes No Container: Preservation: Initials:

Was Client Service Supervisor notified of discrepancies: Yes or No N/A Notified by:

Explanations/Comments:

Labeled by: MD Checked by:

Moore Twining Associates, Inc.

Sample Integrity Page 3 of 3 WO# BA09006 MTA Bottles: Yes or No

Plastic 125mL (A)	Plastic 250mL (B)	Plastic 1L (C)	Amber Glass (AG)
Sample(s) Received		1	
Bact 100mL Thiosulfate		1C	
None Preserved Plastic		1A	
HNO3 Plastic			
H2SO4 Plastic			
NaOH Plastic			
300mL DO Bottle			
Other			
Client Own			
1L Plastic NaOH/ZnAc			
250mL (AG) None			
250mL (AG) H2SO4			
250mL (AG) Thio 547, 548			
250mL (AG) Other			
500mL Clear Glass None			
1L (AG) None			
1L (AG) HCl			
1L (AG) Thio 525, 515			
40mL (AG VOA) Thio + K Citrate 531.2			
40mL VOA Vial - HCl		2	
40mL VOA Vial - None			
40mL VOA Vial - H3PO4			
40mL VOA Vial (AG) - thio (THM)			
40mL VOA Vial - Na2SO3 (thio)			
Borate/Carbonate Buffer			
Soil Jar Clear Glass 125mL 250mL 500mL			
THM 40mL VOA None			
Plastic Bag			
Soil Tube			
Tedlar Bags			
Asbestos 1L Plastic			
Gross Alpha/Beta 1L HNO3 each			
Radiological 226/228 1L HNO3 each			
Radon			
Low Level Hg/Metals Double Bag			

APPENDIX C

Zalco Laboratories, Inc. Report
Dated May 27, 2015

ZALCO LABORATORIES, INC.
Analytical & Consulting Services

4309 Armour Avenue
Bakersfield, California 93308

(661) 395-0539
FAX (661) 395-3069

May 27, 2015

Kristine Boyer
Crimson Resource Mgmt
5001 California Ave., Suite 206
Bakersfield, CA 93309

TEL: (661) 343-3205
FAX: (661) 716-5008

Project ID:
RE: 1504150

Dear Kristine Boyer:

Zalco Laboratories, Inc. received 1 samples on 4/14/2015 for the analyses presented in the following report.

We appreciate your business and look forward to serving you in the future. Please feel free to call our office if you have any questions regarding these test results.

Sincerely,

Juan Magana
Project Manager
CC:

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative
The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Note: Samples analyzed for regulatory purposes should be put on ice immediately after sampling and received by the laboratory at temperatures between 0-6°C. Microbiological analysis requires samples to be at least 4-10°C when received at the laboratory. For additional information regarding the limitations of the method(s) referred to, please call us at 661-395-0539.

ZALCO LABORATORIES, INC.
Analytical & Consulting Services

4309 Armour Avenue
Bakersfield, California 93308

(661) 395-0539
FAX (661) 395-3069

Crimson Resource Mgmt	Project: RWQCB Oilfield Ponds - 2Q2015	Work Order No.: **1504150**
5001 California Ave., Suite 206	Project #:	Reported: 05/27/2015
Bakersfield, CA 93309	Attention: Kristine Boyer	Received: 04/14/2015 13:10

Lab Sample ID: **1504150-01**	Collected By: Jeremiah Johnson
Client Sample ID: Asphalto Sump	Date Collected: 4/14/2015 11:05:00AM

Analyte	Results	PQL		Units	Flag	Method	Date Prepared	Date Analyzed	Init.
Alkalinity									
Total Alkalinity	3900	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
Bicarbonate (HCO3)	3900	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
Carbonate (CO3)	<10	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
Hydroxide (OH)	<10	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
CAM, Toxicity (17 Metals)			*TTLC Limits*						
Antimony	<0.20	0.20	*500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Arsenic	0.062	0.020	*500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Barium	12	0.10	*10000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Beryllium	<0.010	0.010	*75*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Cadmium	<0.010	0.010	*100*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Chromium	<0.050	0.050	*2500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Cobalt	<0.10	0.10	*8000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Copper	<0.050	0.050	*2500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Lead	<0.050	0.050	*1000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Mercury	<0.0020	0.0020	*20*	mg/L		SW846 7470A	4/16/15	4/16/15	SS
Molybdenum	<0.10	0.10	*3500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Nickel	0.056	0.050	*2000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Selenium	<0.05	0.05	*100*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Silver	<0.020	0.020	*500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Thallium	<0.50	0.50	*700*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Vanadium	<0.10	0.10	*2400*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Zinc	<0.050	0.050	*5000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
General Chemistry			*MCL Limits*						
Fluoride	<1.0	1.0	*2*	mg/L		EPA 300.0	4/14/15	4/14/15	MSS
Nitrate as NO3	<2000	2000	*45*	mg/L		EPA 300.0	4/14/15	4/14/15	MSS
Electrical Conductivity	51	0.010		mmhos/cm		SM 2510B	4/14/15	4/14/15	SAM
Chloride	21000	2000		mg/L		EPA 300.0	4/14/15	4/14/15	MSS
pH	7.50			pH Units		EPA 150.1	4/14/15	4/14/15	SAM
Sulfate as SO4	<5.0	5.0		mg/L		EPA 300.0	4/14/15	4/14/15	MSS
Total Dissolved Solids	32000	10		mg/L		SM 2540C	4/14/15	4/14/15	SAM
Hardness									
Hardness (as CaCO3)	200	2.0		mg/L		SM 2340B	4/16/15	4/16/15	SS

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative

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Bakersfield, California 93308

(661) 395-0539
FAX (661) 395-3069

Crimson Resource Mgmt	Project: RWQCB Oilfield Ponds - 2Q2015	Work Order No.: **1504150**
5001 California Ave., Suite 206	Project #:	Reported: 05/27/2015
Bakersfield, CA 93309	Attention: Kristine Boyer	Received: 04/14/2015 13:10

Lab Sample ID: **1504150-01**	Collected By: Jeremiah Johnson
Client Sample ID: Asphalto Sump	Date Collected: 4/14/2015 11:05:00AM

Analyte	Results	PQL	Units	Flag	Method	Date Prepared	Date Analyzed	Init.
Metals								
Lithium	3.3	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Metals - As Received								
Magnesium	28	0.50	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Potassium	88	5.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Sodium	16000	350	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Calcium	34	0.50	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Iron	<1.0	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Boron	160	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Barium	18	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Copper	<0.50	0.50	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Silica (SiO2)	63	40	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Strontium	14	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Manganese	<0.30	0.30	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Oil & Grease Testing								
TRPH	41.0	5.00	mg/L		EPA 1664	4/24/15	4/24/15	BIG
Semivolatile Organic Compounds								
Indeno(1,2,3-cd)pyrene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Naphthalene	123	50.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Acenaphthylene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Acenaphthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Fluorene	5.9	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Phenanthrene	10.4	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Anthracene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Fluoranthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Pyrene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (a) anthracene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Chrysene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (b) fluoranthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (k) fluoranthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (a) pyrene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Dibenz (a,h) anthracene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (g,h,i) perylene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM

Surrogates	% Recovery	Recovery Limits	Flag

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative

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ZALCO LABORATORIES, INC.
Analytical & Consulting Services

4309 Armour Avenue
Bakersfield, California 93308

(661) 395-0539
FAX (661) 395-3069

Crimson Resource Mgmt
5001 California Ave., Suite 206
Bakersfield, CA 93309

Project: RWQCB Oilfield Ponds - 2Q2015
Project #:
Attention: Kristine Boyer

Work Order No.: **1504150**
Reported: 05/27/2015
Received: 04/14/2015 13:10

Lab Sample ID: **1504150-01**
Client Sample ID: Asphalto Sump

Collected By: Jeremiah Johnson
Date Collected: 4/14/2015 11:05:00AM

Analyte	Results	PQL	Units	Flag	Method	Date Prepared	Date Analyzed	Init.
Semivolatile Organic Compounds								
Nitrobenzene-d5		42.8 0-95					4/20/15 14:56	
2-Fluorobiphenyl		23.8 0-92					4/20/15 14:56	
Terphenyl-dl4		17.8 0-100					4/20/15 14:56	
Subcontracted Analyses								
Gross Alpha	133	15.0	pCi/L		SM 7110C	4/21/15	4/22/15	JMM
Radium-226	<3.00	3.00	pCi/L		E903.1	4/17/15	4/22/15	JMM
Radium-228	<2.00	2.00	pCi/L		EPA Ra-05	4/28/15	4/30/15	JMM
Uranium (ug/L)	<20.0	20.0	pCi/L		E908	5/19/15	5/19/15	JMM
Volatile Organic Compounds								
m,p-Xylene	1980	250	ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Benzene	4050	250	ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Xylenes, total	2770		ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Methyl tert-Butyl Ether	<5.00	5.00	ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Ethylbenzene	356	25.0	ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Toluene	5990	250	ug/L		SW846 8260B	4/21/15	4/21/15	HLP
o-Xylene	791	250	ug/L		SW846 8260B	4/21/15	4/21/15	HLP

Surrogates	% Recovery	Recovery Limits	Flag	
1,2-Dichloroethane-d4	117	89-165		4/21/15 13:40
Toluene-d8	93.9	65-124		4/21/15 13:40
4-Bromofluorobenzene	153*	94-114		4/21/15 13:40

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative
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Bakersfield, California 93308
(661) 395-0539
FAX (661) 395-3069

Crimson Resources Management Corp
5001 California Ave
Bakersfield
CA
93309

Laboratory ID: 1504150-01
Date Received:
Date Reported:

Attention:

Client Sample ID: Asphalt Sump

CATION / ANION BALANCE

Cations	mg/L	meq/L
Calcium	34.00	1.70
Iron:	0.00	0.00
Magnesium:	28.00	2.30
Potassium	88.00	2.25
Sodium	16000.00	695.74

Anions	mg/L	meq/L
Bicarbonate:	3897.00	63.87
Carbonate	0.00	0.00
Chloride	21000.00	609.14
Nitrate	0	0
Hydroxide:	0.00	0.00
Sulfate:	0.00	0.00
Silica	63.00	1.66

Cation Sum	701.99 meq/L	Anion Sum	674.66 meq/L

Balance (Anion / Cation % Difference): 1.99% %

CHAIN OF CUSTODY, ID# [ ]

ZALCO LABORATORIES, INC.
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2186 Eastman Avenue, Suite 103, Ventura, CA 93003, (805) 477-0114, Fax (805) 477-0125
www.zalcolabs.com

Client PO:
Project ID:
Quote ID:

ANALYSIS REQUESTED 15045C

COMPANY	Crimson Resources Management Corp
CONTACT	Kristine Boyer
PHONE	(661)716-5001 ext.31 FAX
ADDRESS	5001 California Ave. Ste 206
	Bakersfield CA 93309
E-MAIL	kboyer@crimsonbak.com
SAMPLER (SIGNATURE)	

COMMENTS

Turnaround Time:
Routine (# working days) X
Rush By [ ] Working Days
EDT [ ]
State Form [ ]
EMAIL [ ]

Notes

LAB #	SAMPLE DESCRIPTION	DATE	TIME	TYPE *	# OF CONTAINERS	RWQCB See Attached	TEMPERATURE °C
1	Asphalto Sump	4/14/2015	11:05	AQ	12	X	5.6°

Relinquished By: | Company | Date | Time | Received By: | Company:

JJohnson	Zalco labs	04/14/15	13:10		Zalco

NOTE: Samples Discarded 30 days after results unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

* Sample Type Key: Aq-Aqueous; BS-Biosolid; DW-Drinking Water; GW-Groundwater; G-Gas LPG-Liquid Petroleum Gas; OL-Oil; P-Petroleum; S-Solid/Soil; ST-Storm water WW-Wastewater

ZALCO LABORATORIES, INC.
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May 27, 2015

Kristine Boyer
Crimson Resource Mgmt
5001 California Ave., Suite 206
Bakersfield, CA 93309

TEL: (661) 343-3205
FAX: (661) 716-5008

Project ID:
RE: 1504150

Dear Kristine Boyer:

Zalco Laboratories, Inc. received 1 samples on 4/14/2015 for the analyses presented in the following report.

We appreciate your business and look forward to serving you in the future. Please feel free to call our office if you have any questions regarding these test results.

Sincerely,

Juan Magana
Project Manager
CC:

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative
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Crimson Resource Mgmt	Project: RWQCB Oilfield Ponds - 2Q2015	Work Order No.: **1504150**
5001 California Ave., Suite 206	Project #:	Reported: 05/27/2015
Bakersfield, CA 93309	Attention: Kristine Boyer	Received: 04/14/2015 13:10

Lab Sample ID: **1504150-01**	Collected By: Jeremiah Johnson
Client Sample ID: Asphalto Sump	Date Collected: 4/14/2015 11:05:00AM

Analyte	Results	PQL		Units	Flag	Method	Date Prepared	Date Analyzed	Init.
Alkalinity									
Total Alkalinity	3900	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
Bicarbonate (HCO3)	3900	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
Carbonate (CO3)	<10	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
Hydroxide (OH)	<10	10		mg/L		SM 2320B	4/14/15	4/14/15	SAM
CAM, Toxicity (17 Metals)			*TTLC Limits*						
Antimony	<0.20	0.20	*500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Arsenic	0.062	0.020	*500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Barium	12	0.10	*10000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Beryllium	<0.010	0.010	*75*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Cadmium	<0.010	0.010	*100*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Chromium	<0.050	0.050	*2500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Cobalt	<0.10	0.10	*8000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Copper	<0.050	0.050	*2500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Lead	<0.050	0.050	*1000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Mercury	<0.0020	0.0020	*20*	mg/L		SW846 7470A	4/16/15	4/16/15	SS
Molybdenum	<0.10	0.10	*3500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Nickel	0.056	0.050	*2000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Selenium	<0.05	0.05	*100*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Silver	<0.020	0.020	*500*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Thallium	<0.50	0.50	*700*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Vanadium	<0.10	0.10	*2400*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
Zinc	<0.050	0.050	*5000*	mg/L		SW846 6010B	4/17/15	4/21/15	SS
General Chemistry			*MCL Limits*						
Fluoride	<1.0	1.0	*2*	mg/L		EPA 300.0	4/14/15	4/14/15	MSS
Nitrate as NO3	<2000	2000	*45*	mg/L		EPA 300.0	4/14/15	4/14/15	MSS
Electrical Conductivity	51	0.010		mmhos/cm		SM 2510B	4/14/15	4/14/15	SAM
Chloride	21000	2000		mg/L		EPA 300.0	4/14/15	4/14/15	MSS
pH	7.50			pH Units		EPA 150.1	4/14/15	4/14/15	SAM
Sulfate as SO4	<5.0	5.0		mg/L		EPA 300.0	4/14/15	4/14/15	MSS
Total Dissolved Solids	32000	10		mg/L		SM 2540C	4/14/15	4/14/15	SAM
Hardness									
Hardness (as CaCO3)	200	2.0		mg/L		SM 2340B	4/16/15	4/16/15	SS

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Analytical & Consulting Services

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Bakersfield, California 93308

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FAX (661) 395-3069

Crimson Resource Mgmt
5001 California Ave., Suite 206
Bakersfield, CA 93309

Project: RWQCB Oilfield Ponds - 2Q2015
Project #:
Attention: Kristine Boyer

Work Order No.: **1504150**
Reported: 05/27/2015
Received: 04/14/2015 13:10

Lab Sample ID: **1504150-01**
Client Sample ID: Asphalto Sump

Collected By: Jeremiah Johnson
Date Collected: 4/14/2015 11:05:00AM

Analyte	Results	PQL	Units	Flag	Method	Date Prepared	Date Analyzed	Init.
Metals								
Lithium	3.3	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Metals - As Received								
Magnesium	28	0.50	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Potassium	88	5.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Sodium	16000	350	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Calcium	34	0.50	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Iron	<1.0	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Boron	160	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Barium	18	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Copper	<0.50	0.50	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Silica (SiO2)	63	40	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Strontium	14	1.0	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Manganese	<0.30	0.30	mg/L		EPA 200.7	4/16/15	4/16/15	SS
Oil & Grease Testing								
TRPH	41.0	5.00	mg/L		EPA 1664	4/24/15	4/24/15	BIG
Semivolatile Organic Compounds								
Indeno(1,2,3-cd)pyrene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Naphthalene	123	50.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Acenaphthylene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Acenaphthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Fluorene	5.9	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Phenanthrene	10.4	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Anthracene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Fluoranthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Pyrene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (a) anthracene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Chrysene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (b) fluoranthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (k) fluoranthene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (a) pyrene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Dibenz (a,h) anthracene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM
Benzo (g,h,i) perylene	<10.0	10.0	ug/L		SW846 8270C	4/17/15	4/20/15	JMM

Surrogates	% Recovery	Recovery Limits	Flag

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative
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Crimson Resource Mgmt	Project: RWQCB Oilfield Ponds - 2Q2015	Work Order No.: **1504150**
5001 California Ave., Suite 206	Project #:	Reported: 05/27/2015
Bakersfield, CA 93309	Attention: Kristine Boyer	Received: 04/14/2015 13:10

Lab Sample ID: **1504150-01**	Collected By: Jeremiah Johnson
Client Sample ID: Asphalto Sump	Date Collected: 4/14/2015 11:05:00AM

Analyte	Results	PQL		Units	Flag	Method	Date Prepared	Date Analyzed	Init.
Semivolatile Organic Compounds									
Nitrobenzene-d5		42.8	0-95					4/20/15 14:56	
2-Fluorobiphenyl		23.8	0-92					4/20/15 14:56	
Terphenyl-dl4		17.8	0-100					4/20/15 14:56	
Subcontracted Analyses									
Gross Alpha	133	15.0		pCi/L		SM 7110C	4/21/15	4/22/15	JMM
Radium-226	<3.00	3.00		pCi/L		E903.1	4/17/15	4/22/15	JMM
Radium-228	<2.00	2.00		pCi/L		EPA Ra-05	4/28/15	4/30/15	JMM
Uranium (ug/L)	<20.0	20.0		pCi/L		E908	5/19/15	5/19/15	JMM
Volatile Organic Compounds									
m,p-Xylene	1980	250		ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Benzene	4050	250		ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Xylenes, total	2770			ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Methyl tert-Butyl Ether	<5.00	5.00		ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Ethylbenzene	356	25.0		ug/L		SW846 8260B	4/21/15	4/21/15	HLP
Toluene	5990	250		ug/L		SW846 8260B	4/21/15	4/21/15	HLP
o-Xylene	791	250		ug/L		SW846 8260B	4/21/15	4/21/15	HLP

Surrogates	% Recovery	Recovery Limits	Flag	
1,2-Dichloroethane-d4	117	89-165		4/21/15 13:40
Toluene-d8	93.9	65-124		4/21/15 13:40
4-Bromofluorobenzene	153*	94-114		4/21/15 13:40

NSS: Non Sufficient Sample H: Exceeds Analysis Hold Time TTLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TCLP: Toxicity Characteristic Leaching Procedure MCL: Maximum Contaminant Level *: See Case Narrative
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Crimson Resources Management Corp
5001 California Ave
Bakersfield
CA
93309

Laboratory ID: 1504150-01
Date Received:
Date Reported:

Attention:

Client Sample ID: Asphalt Sump

CATION / ANION BALANCE

Cations	mg/L	meq/L	Anions	mg/L	meq/L
Calcium	34.00	1.70	Bicarbonate:	3897.00	63.87
Iron:	0.00	0.00	Carbonate	0.00	0.00
Magnesium:	28.00	2.30	Chloride	21000.00	609.14
Potassium	88.00	2.25	Nitrate	0	0
Sodium	16000.00	695.74	Hydroxide:	0.00	0.00
			Sulfate:	0.00	0.00
			Silica	63.00	1.66
Cation Sum		701.99 meq/L	Anion Sum		674.66 meq/L

Balance (Anion / Cation % Difference): 1.99% %

ZALCO LABORATORIES, INC.

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CHAIN OF CUSTODY, ID# _____

Client PO: _____
Project ID: _____
Quote ID: _____

ANALYSIS REQUESTED 15041 50

COMPANY	Crimson Resources Management Corp
CONTACT	Kristine Boyer
PHONE	(661)716-5001 ext.31 FAX
ADDRESS	5001 California Ave. Ste 206
	Bakersfield CA 93309
E-MAIL	kboyer@crimsonbak.com
SAMPLER (SIGNATURE)	

COMMENTS

Turnaround Time:
Routine (# working days) X
Rush By ___ Working Days
EDT ___
State Form ___
EMAIL ___

LAB #	SAMPLE DESCRIPTION	DATE	TIME	TYPE *	# OF CONTAINERS	RWQCB See Attached	TEMPERATURE (°C)	Notes
1	Asphalto Sump	4/14/2015	11:05	AQ	12	X	5.0	

Relinquished By: | Company | Date | Time | Received By: | Company:

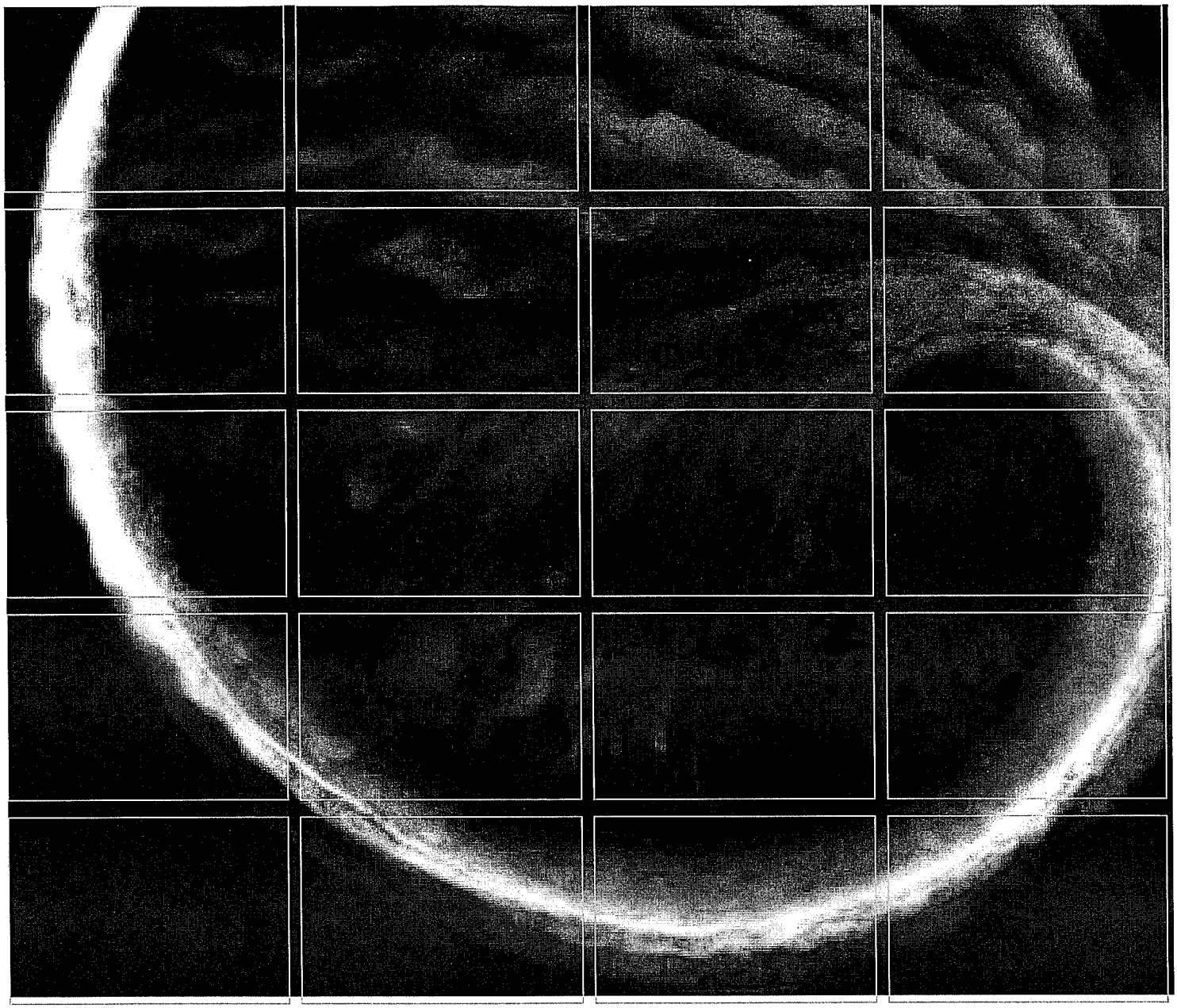
JJohnson	Zalco labs	04/14/15	13:10		Zalco

NOTE: Samples Discarded 30 days after results unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

* Sample Type Key: Aq-Aqueous; BS-Biosolid; DW-Drinking Water; GW-Groundwater; G-Gas LPG-Liquid Petroleum Gas; OL-Oil; P-Petroleum; S-Solid/Soil; ST-Storm water WW-Wastewater

APPENDIX D

Crimson Operations and Maintenance Plan



O&M Plan

Asphalto Sump Facility
Kern County, California

Prepared for:
Crimson Resource Management

August 2009

www.erm.com

Crimson Resource Management

O&M Plan

Asphalto Sump Facility
Kern County, California

August 2009

0103718

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1.0 INTRODUCTION

1.1 PURPOSE

This Operation and Maintenance Plan (O&M Plan) describes the actions to be undertaken to minimize potential occurrence of and control accidental discharges and to provide embankment maintenance and wastewater sampling procedures. The objectives of this O&M Plan are to describe the practices that will enhance embankment stability and maintain a minimum freeboard of 2 feet.

1.2 FACILITY DESCRIPTION

1.2.1 Facility Location

The Asphalto Sump Facility is located north of Skyline Road and northeast of the La Paloma Power Plant, near McKittrick in Kern County, California. Figure 1 shows the facility location on a U.S. Geological Survey 7.5-minute series topographic map.

1.2.2 Site Description

Figure 2 depicts the general configuration of the site. Storm water flows in a northeasterly direction at the facility. All storm water flows off the site and onto adjacent fields.

The facility consists of sixteen earth-lined sumps and covers an area of approximately 5.2 acres. Water is discharged to the sumps for disposal by infiltration and evaporation. No buildings or structures are located on the site.

2.0 *OPERATION AND MAINTENANCE TEAM*

The Operation and Maintenance Team at the Asphalto Sump Facility consists of Ms. Debra Sovay, Environmental Health and Safety Manager. Ms. Sovay is responsible for all aspects of the O&M Plan, including inspections, reviews, reports, and preventive maintenance.

3.0 *SUMP MAINTAINANCE PLAN*

This plan will include measures to control erosion, seepage, animal burrows, drainage, and slope failure. Also included are facility and freeboard inspection procedures.

3.1 *EROSION CONTROL MEASURES*

Erosion control measures shall consist of the following:

- Visually inspect each sump on a monthly basis for small gullies, animal burrows, slope stability, seepage, and perform necessary repairs;
- Place straw bales to prevent erosion from run-on and/or to channel runoff;
- Visually inspect each sump after each storm event and completion of any necessary repairs; and
- Replace eroded soil with native material compacted to 90 percent or use a mixture of lean-concrete or soil-cement.

3.2 *EMBANKMENT CONTROL MEASURES*

The following measures shall be taken to minimize the potential for slope failure:

- A minimum interior slope of 3:1 shall be maintained at all times;
- A minimum exterior slope of 2:1 shall be maintained at all times; and
- Berms shall have a minimum width of 2 feet between sumps.

A permanent marker shall be placed in each sump, denoting water level at maximum capacity and available freeboard (minimum 2 feet).

All discharge shall remain within the designated disposal area at all times. All sumps shall be operated and maintained to prevent liquids, precipitates, and sludges from concentrating to hazardous levels. The sumps shall not cause a nuisance or condition of pollution as defined in Section 13050 of the California Water Code.

3.3 *WILDLIFE CONTROL MEASURES*

Embankments shall be maintained free of animal burrows. If burrows are found, the following procedures shall be taken:

- Obtain a qualified pest control company to bait burrowing animals (safeguards will be taken to account for sensitive wildlife species and humans);
- Fill in burrow with native or fill soil and compact to existing grade; and
- Remove and relocate animals.

Sumps containing oil shall be netted to prohibit the entry of wildlife in accordance with Title 14, California Code for Regulations Section 1770 (b) (3).

3.4 *DRAINAGE CONTROL MEASURES*

Prior to the start of the rainy season, the necessary erosion control measures shall be implemented and any necessary construction, maintenance, or repairs shall be completed. This shall be performed on an annual basis.

3.5 *SEEPAGE CONTROL MEASURES*

The sumps shall be inspected monthly for seepage. The toe and exterior walls of the sumps shall be visually inspected for discoloring and moisture. If seepage is detected, the following control measures shall be taken:

- Drain sump; and
- Remove impacted material and replace with imported or fill material with appropriate physical properties to minimize seepage.

3.6 *FREEBOARD INSPECTION*

Freeboard measurements of the sumps shall be conducted and recorded twice per month to the nearest tenth of a foot. The minimum allowable freeboard, measured vertically, is 2 feet. A record of this inspection must include the date of the inspection, name of the individual(s) who

performed the inspection, and the freeboard of each sump. Freeboard monitoring reports shall be submitted with the annual reports.

3.7 *FACILITY INSPECTION*

An inspection of the facility will be conducted annually and within 24 hours following any major rain event to identify any damage. Necessary repairs will be implemented as soon as practical. Repairs shall be reported to the Central Valley Regional Water Quality Control Board (RWQCB) within 30 days of completion. A record of this inspection must include the date of the inspection, name of the individual(s) who performed the inspection, and the observations made. The results of these inspections shall be summarized in the annual report.

4.0 *WASTEWATER SAMPLING AND ANALYSIS PLAN*

The purpose of the Wastewater Sampling and Analysis Plan is to characterize the quality of wastewater discharged to the sumps. This plan will include an annual sampling and analysis plan and a quality assurance/quality control plan.

4.1 *DESCRIPTION OF SAMPLING SITES*

The locations where wastewater sampling will be conducted are defined according to the conditions of the Monitoring and Reporting Program of the Waste Discharge Requirements (WDRs). The WDRs indicate that wastewater be sampled at the point of discharge into the sumps. If discharge is not occurring, the sample shall be collected from the sump nearest the discharge point.

4.2 *WASTEWATER SAMPLE COLLECTION PROCEDURES*

The WDRs require facility operators to collect wastewater grab samples at least once per year. Total volume of the grab sample should be sufficient to provide for all monitoring parameters. Sizes of sample collection containers will vary. The analytical lab should provide sample containers and sample size should be consistent for the use of those containers.

Recommended grab sample procedures include:

- Wastewater shall be sampled at the point of discharge into the sump. If discharge is not occurring, the sample shall be collected from the sump nearest the discharge point;
- Collect the sample using a laboratory provide container;
- Collect adequate sample volume to ensure that all sample containers can be filled;
- Labels shall be completed including the sample date, outfall location, and sampler's initials;
- Refrigerate samples in laboratory-designated containers until transported to the laboratory for analysis; and

- Samples shall be submitted for analysis within 24 hours of collection, and analysis shall be completed within the designated holding times specified by the appropriate Environmental Protections Agency (EPA) method.

The following information shall be recorded for each sample:

- Date, exact location, and time of sample collection;
- Name of the individual(s) who performed the sampling;
- Date(s) the analyses were performed;
- Name of the laboratory which performed the analyses;
- Analytical techniques or methods used; and
- Results of analyses.

4.3 *CHEMICAL ANALYSIS PROCEDURES*

All analyses shall be conducted by a laboratory certified by the State Department of Health Services. Chemical analyses shall be performed as required by Water Code Section 13176, Health and Safety Code Section 100825. All analyses shall be made in accordance with the latest edition of *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA 600 Series) and *Test Methods for Evaluating Solid Waste* (SW 846 – latest edition).

Minimum analytical requirements are reflected on Table 1.

Table 1 - Analytical Testing Requirements

Parameter / Constituent	Analytical Method[1]	Reporting Units
Total Annual Flow	estimate	barrel or gallon
Electrical Conductivity, EC @ 25C	EPA 120.1	micromhos per centimeter (umhos/cm)
Total Dissolved Solids (TDS)	EPA 2540C	milligrams per liter (mg/L)
Chloride	EPA 300.0	mg/L
Boron	EPA 200.7	mg/L
Oil and Grease	EPA 1664A	micrograms per liter (ug/L)

1 Other approved analytical methods may be proposed if they provide equal or greater accuracy or precision

4.4 *QUALITY ASSURANCE PROCEDURES*

Field and laboratory quality assurance procedures are required to produce accurate and valid wastewater monitoring results. The sampler will be identified (by initials) on the sample container. Chain-of-custody forms for all samples collected during sampling events will be prepared and will document the possession of and the responsibility for the sample from collection through chemical analysis. These forms, which are typically provided by the laboratory to which samples will be sent and analyzed, document the sample name, location of sample, container, preservation, and analyses to be completed. All responsible personnel will sign, date, and retain one copy of the form. The designated laboratory receives the original form with each sample shipment.

5.0 *REPORTING*

Reporting requirements described in the Monitoring and Reporting Program No. R5-2004-058 of the WDRs are summarized below.

5.1 *ANNUAL REPORT*

Wastewater effluent analytical data and pertinent information will be maintained to demonstrate compliance with the WDRs. All information observed and collected will be summarized in an annual report to be submitted no later than May 1st of each year to the Executive Officer of the RWQCB responsible for the area where the facility is located. Asphalto Sump is under the jurisdiction of the Central Valley RWQCB.

The report will include a summary of wastewater sampling results, facility inspections, and freeboard monitoring reports. The report shall be signed and certified in accordance with Standard Provision Section B.3.d(3) of the WDRs (see Appendix A). The certification statement is as follows:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on m inquiry of those individuals immediately responsible for obtaining information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

5.2 *NON-COMPLIANCE REPORTING*

The RWQCB shall be notified via telephone as soon as knowledge of non-compliance or potential for non-compliance occurs. Within 2 weeks of the notification call, the facility shall be followed up with a written notification confirming the non-compliance. The written notification shall state the nature, time, and cause of non-compliance, and shall describe actions necessary to achieve compliance, and include schedule indicating when compliance will be achieved.

5.3 *NOTICE OF PLANNED FACILITY CHANGES*

Notification shall be given to the RWQCB of any change in the character, location, or volume of discharge. Upon such changes, a new Report of Waste Discharge shall be filed with the RWQCB.

5.4 *RECORD KEEPING*

Records of all monitoring information, maintenance records, copies of all reports, records of all data, and other related material shall be maintained and kept in a centralized location to provide quick access to records. All records shall be maintained for a minimum of 3 years from the date of data generation. The Operation and Maintenance Team will be responsible for maintaining and implementing the record keeping process. A sample inspection form is provided in Appendix B.

Relevant documents, reports, and forms required by WDR R5-2004-0058 will be maintained onsite. Maintenance of these records and reporting information provides documentation of implementation of this O&M Plan and the facility's compliance with requirements of the WDRs.

Figures

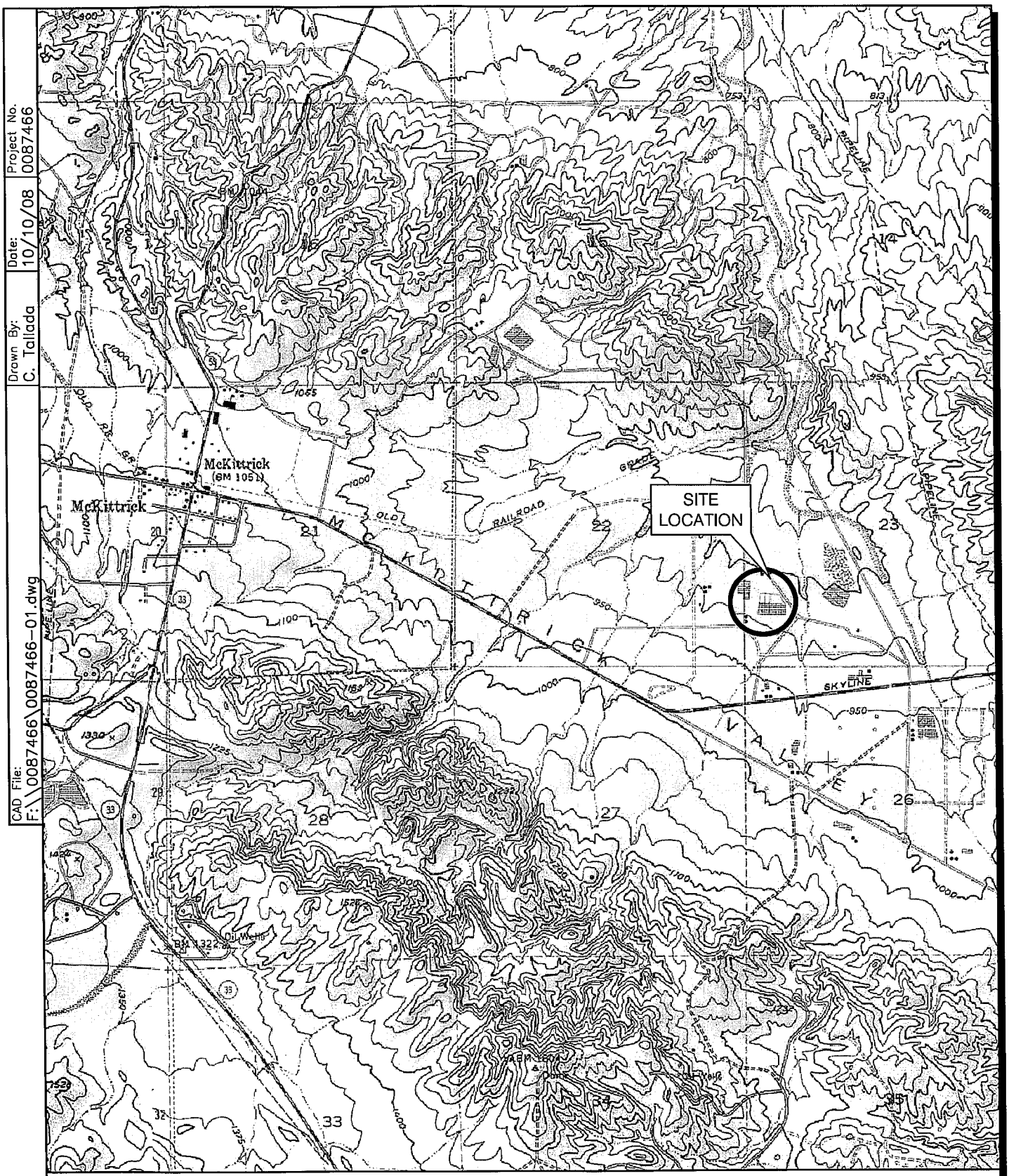


Figure 1
Site Location Map
Asphalto Sumps
McKittrick, California
ERM *10/08*

CAD File:	Drawn By:
F:\\0087466\0087466-02.dwg	C. Tallada

Site Surfa

Appendix A

WDR R5-2004-0058

California Regional Water Quality Control Board
Central Valley Region
Robert Schneider, Chair

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

Fresno Branch Office
Internet Address: http://www.swrcb.ca.gov/~rwqcb5
1685 E Street, Fresno, California 93706-2020
Phone (559) 445-5116 • FAX (559) 445-5910

6 May 2004

CERTIFIED MAIL
7003 1680 0002 4300 5872

Mr. Joe Ippolito
Operations and Engineering Manager
Crimson Resource Management Corp.
5001 California Avenue, Suite 206
Bakersfield, CA 93309

TRANSMITTAL OF ADOPTED WASTE DISCHARGE REQUIREMENTS FOR CRIMSON RESOURCE MANAGEMENT CORP., ASPHALTO STANDARD LEASE, ASPHALTO OIL FIELD, KERN COUNTY

Enclosed is an official copy of Order No. R5-2004-0058, as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its 23 April 2004 meeting.

SHELTON R. GRAY
Senior Engineering Geologist

from BV
RECEIVED
JUN 24 2004
CRIMSON KERN

CDH:cdh/rac

Enclosure: Adopted Order
Standard Provisions (Discharger Only)

cc: Ms. Catherine George, Office of Chief Counsel, SWRCB, Sacramento
Mr. Jim Kassel, Division of Water Quality, SWRCB, Sacramento
Mr. Randy Adams, California Department of Oil, Gas & Geothermal Resources, Bakersfield
Department of Health Services, Office of Drinking Water, Fresno
Department Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Kern County Environmental Health Services, Bakersfield
Kern County Planning and Development Services Department, Bakersfield
Mr. Bob Ferguson, Bob Ferguson - Independent, Lake Forest, CA
Mr. Charles Cather, Cather-Herley Oil Company, Bakersfield

RECEIVED
MAY 07 2004
CRIMSON KERN

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0058

WASTE DISCHARGE REQUIREMENTS
FOR
CRIMSON RESOURCE MANAGEMENT CORP.
ASPHALTO STANDARD LEASE
ASPHALTO OILFIELD
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. Crimson Resource Management Corp. (hereafter Discharger), a Colorado corporation, owns and operates crude oil production wells on the lease designated as "Asphalto Standard" in the Asphalto Oil Field within the McKittrick Valley. The Discharger is one of three within the oilfield.

2. The Discharger discharges to sixteen unlined surface impoundments (with approximate dimensions ranging from 65' x 90' to 200' x 265'), generally known in the industry as sumps. Approximately 1,200 barrels/day of produced wastewater are discharged to the sumps for disposal by solar evaporation and percolation.

3. The wastewater disposal operation is currently regulated by Waste Discharge Requirements (WDRs), Resolution No. 64-05001. The WDRs are being updated since they are no longer adequate or consistent with current State regulations and Regional Board policies and plans.

4. This Order implements the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition-1995* (hereafter Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.

LOCATION AND DESCRIPTION

5. The Discharger's facility is approximately two miles southeast of the unincorporated community of McKittrick, in the W ½ of the SW ¼, of Section 23, T30S, R22E, MDB&M, Assessor Parcel No. 157-210-05-00-9, as shown on Attachments A, B and C, that are attached to and made part of this Order. The Asphalto Oil Field, covers approximately four square miles within the McKittrick Valley, extending from near McKittrick at the northwest to approximately six miles southeast of McKittrick at the southeast end of the valley as shown on Attachments A, B and C.

6. The McKittrick Valley is a localized northwest-southeast structural trough formed by tectonic compressional forces associated with movement along the San Andreas Fault. McKittrick Valley is situated between the surficial features of the Elk Hills, McKittrick, Belgian Anticline and Buena Vista Hills oilfields where Pliocene-Pleistocene rocks crop out surrounding the valley. The trough contains over 10,000 feet of sedimentary deposits ranging in age from the Jurassic to Recent. The most recent sediments deposited in the valley trough are the 1,000+ foot thick Pleistocene Tulare Formation and the Quaternary Alluvium, which ranges up to 450 feet thick in the center of the valley.

7. The Tulare Formation, which lies stratigraphically below the Alluvium, consists of coarse-grained beds of poorly sorted sands and gravel, and beds of clay, silt, and fine sand. It is not an oil producing formation in Asphalto Oil Field.

8. No known active faults occur on or near the facility. The nearest known active faults are the Buena Vista Fault and the San Andreas Fault, which are approximately eleven miles southeast and ten miles southwest of the facility, respectively.

9. Land within the immediate area is used for oil exploration and production.

10. The discharge occurs in the Antelope Plain Hydrologic Area (No. 558.60), as depicted on interagency hydrologic maps prepared by the Department of Water Resources (DWR) in August 1986.

11. The climate in McKittrick Valley is semi-arid, with hot, dry summers and cool winters. Available weather data from a monitoring station in Taft (13-miles south) indicates the average annual precipitation is 5.6 inches and the average annual Class A pan evaporation is 95.7 inches.

12. The 100-year and 1000-year, 24-hour precipitation events calculated by DWR are 2.03 and 2.63 inches, respectively.

13. Small, unnamed drainage courses traverse the area in the vicinity of the facility. Some surface flow can be observed in the drainage courses following infrequent storm events during the months of November through April.

14. Flood Insurance Rate Map, Community Parcel Number 060075 950 B, dated 29 September 1986, indicates that the facility is not within a 100-year flood plain.

GROUNDWATER INFORMATION

15. The Basin Plan designates beneficial uses for groundwater in this region of the Tulare Lake Basin as municipal, agricultural, and industrial supply.

16. The West Kern Water District supplies domestic and industrial water to a 250 square mile area in western Kern County, including the McKittrick Valley area, from groundwater wells in the Tupman area. Other sources of water supply include State Water project deliveries and agreements with various Kern County water agencies. There are no other known alternative water supplies. There is no record of groundwater wells within 17 miles of the facility.

17. Pursuant to 40 Code of Federal Regulation (40 CFR), Section 146.4, the Tulare Formation in the Asphalto Oil Field has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons. The California State Division of Oil, Gas & Geothermal Resources is the permitting authority for Class II injection wells used for the subsurface injection of produced oilfield wastewater.

18. A detailed hydrogeologic study was conducted for the McKittrick Valley area. Technical information was developed during the study characterizing the hydrogeologic conditions in the area including the Discharger's facility. Results of the study demonstrate the absence of groundwater within the Alluvium in the McKittrick Valley. Both the Alluvium and Upper Tulare are geologically isolated from usable groundwater in the San Joaquin Valley to the east.

19. The Alluvium, approximately 350 feet thick, consists of poorly sorted, unconsolidated silt and clay with lenticular sand and gravel deposits chiefly derived from coalescing alluvial fans. The alluvial section is underlain throughout the valley, by an approximately 62-foot thick, laterally continuous, basal alluvial clay. Review of the geophysical logs indicates that the base of the upper alluvial sediments dip inward, in an elongated and continuous basin-like structure near the center of the McKittrick Valley.

20. The uppermost groundwater occurs nearly 200 feet below the basal alluvial clay, in a confined sand within the Upper Tulare, approximately 545 feet below ground surface. The groundwater is of poor quality, with a Total Dissolved Solids concentration of greater than 6,200 mg/L and a boron concentration greater than 10 mg/L.

21. The following is a summary of groundwater conditions in the area: 1) groundwater of limited aereal extent occurs in the Upper Tulare formation beneath the Asphalto Oil Field; 2) the groundwater occurs at a depth of over 500-feet; 3) is of poor quality with Total Dissolved Solids of greater than 6,200 mg/L and a boron concentration greater than 10 mg/L; 5) it has no identified existing beneficial uses; 6) it is geologically isolated from usable groundwater in the south San Joaquin Valley; and 7) it is not currently used, or likely to be used in the foreseeable future, and without extensive treatment, is not suitable for municipal or domestic supply.

22. Based on Finding Nos. 15-21, there is no groundwater in the area of the discharge that can reasonably be expected to be used for municipal, agricultural, or industrial supply.

WASTEWATER CHARACTERISTICS

23. Connate formation water (wastewater) is co-produced in association with crude oil, primarily from hydrocarbon bearing marine formations in the Asphalto Oil Field by the oilfield operators. The wastewater at the Discharger's facility is a sodium-chloride type having a high inorganic salt content. Benzene, including toluene, ethylbenzene and xylene (BTEX) can be naturally occurring in the light fraction of crude oils. Analytical results show that the wastewater has the following approximate range of characteristics:

Constituent	Range of Concentrations
Total Dissolved Solids (TDS) (mg/L)	20,000 - 30,000
Electrical conductivity (EC) (µmhos/cm)	40,000 – 60,000
Chloride (mg/L)	13,000 - 17,000

Constituent	Range of Concentrations
Boron (mg/L)	100 – 250
Benzene (µg/L)	N/D to 25
Toluene, ethylbenzene, and xylene (µg/L)	N/D to 20

POLICY & REGULATIONS

24. Implementation policies in the Basin Plan regarding the disposal of oilfield wastewater indicate that the maximum salinity limits for wastewater in unlined sumps overlying groundwater with existing and future probable beneficial uses are: 1,000 µmhos/cm electrical conductivity (EC), 200 mg/L chloride, and 1 mg/L boron. Discharges to unlined sumps may be permitted if the Discharger successfully demonstrates to the Regional Board in a public hearing that exceeding the maximum salinity limits will not substantially affect water quality nor cause a violation of water quality objectives.

25. The Basin Plan policy noted in Finding No. 24 was adopted to allow the Regional Board the flexibility to consider the beneficial reuse of some wastewater having salinities slightly above the maximum numerical limitations. The reuses included agricultural supply, stock watering and wildlife habitat enhancement. Based on the water quality at this facility, the Discharger does not propose to reuse the wastewater.

26. The "Sources of Drinking Water" policy, which was added to the Basin Plan in 1988, provides that all groundwater in the Tulare Lake Basin is considered to be suitable or potentially suitable for municipal or domestic water supply, and should be so designated by the Regional Board with certain exceptions. One of those exceptions is for groundwater that exceeds 3,000 mg/L in TDS (5,000 µmhos/cm EC), and is not reasonably expected to supply a public water system. A second exception is as stated in Finding No. 17, where pursuant to 40 CFR, Section 146.4, the Tulare Formation has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons.

27. Generally, designated waste is non-hazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan. The discharge of designated waste to land is subject to the requirements of Title 27, California Code of Regulations (CCR), Section 20090(b) (hereafter Title 27).

28. The Discharger is exempt from the requirements of Title 27. The exemption is based upon the following:

    a) The Regional Board is issuing waste discharge requirements;

b) The wastewater discharge, as permitted in the Order, is in compliance with the applicable water quality control plan; and,

c) The wastewater does not need to be managed according to Chapter 11, Division 4.5 of Title 22 as a hazardous waste.

OTHER LEGAL REFERENCES

29. The action to adopt waste discharge requirements for existing facilities is exempt from the provisions of the California Environmental Quality Act (CEQA), in accordance with Title 14, CCR, Section 15301.

30. This Order requires the Discharger to submit technical reports as authorized under California Water Code (CWC) Section 13267 (b)(1), which states in part:

"In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region that could affect the quality of water within its region, shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."

31. The technical reports required by this Order and attached "Monitoring and Reporting Program No. R5-2004-0058, are necessary to assure compliance with these Waste Discharge Requirements. The Discharger operates the facility that discharges the waste subject to this Order.

32. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) general industrial stormwater permit provided it has not experienced a reportable spill since 19 November 1987. It is the Discharger's responsibility to comply with USEPA federal stormwater regulations (40 CFR Parts 122,123, and 124) should it not qualify for exemption.

33. The Regional Board has notified the Discharger, interested agencies, and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

34. The Regional Board, in a public meeting, heard and considered all comments pertaining to this facility and discharge.

35. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.swrcb.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED that Resolution No. 64-05001 be rescinded, and that pursuant to §13263 and §13267 of the California Water Code, Crimson Resource Management Corp., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and plans, policies, and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. The acceptance, treatment, or discharge of "hazardous waste" is prohibited. For the purposes of this Order, the term "hazardous waste" is as defined in Title 27, Section 20164.

2. Discharges to surface water or surface water drainage courses are prohibited except for stormwater discharges permitted by an active NPDES permit or for discharge from facilities exempt from the NPDES permitting requirements.

3. The discharge of wastes other than wastewater associated with the production of crude oil on this lease is prohibited.

B. Discharge Specifications

1. Wastewater shall only be discharged to and confined to the sumps described in Finding No. 2.

2. Wastewater production shall be controlled to the extent necessary to maintain consistent compliance with the terms of this Order.

3. Containment berms for the sumps shall be designed and maintained to prevent leakage, whether from erosion, slope failure, animal burrowing, or some other cause.

4. The sumps shall have sufficient freeboard to prevent overtopping as a result of heavy successive precipitation events, high velocity winds, and seismic shaking. **In no case shall there be less than two feet (measured vertically) of freeboard.**

5. Precipitation and drainage control system shall be designed, constructed, operated, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour precipitation conditions. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and

any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the sumps.

6. The sumps shall be free of oil or effectively netted to preclude entry of wildlife in accordance with Title 14, CCR, Section 1770 (b), (3).

7. All wastewater storage and disposal facilities shall be operated and maintained to prevent liquids, precipitates, and sludges from concentrating to hazardous levels.

8. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution as defined by the California Water Code, Section 13050.

C. Provisions

1. The Discharger shall comply with those applicable sections of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991, which are attached to and made part of this Order. To the extent that the Standard Provisions are inconsistent with any terms, conditions, or requirements in this Order, this Order shall govern.

2. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. The Discharger shall comply with Monitoring and Reporting Program No. R5-2004-0058, which is attached to and made part of this Order. Failing to furnish the reports by the specified deadlines or falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the Discharger.

3. The Discharger may be required to submit additional technical reports as directed by the Executive Officer.

4. The Discharger shall notify Regional Board staff in writing of any proposed change in ownership or responsibility for construction or operation of the facility. This notification shall be given **90 days** prior to the effective date of the change and shall be accompanied by an amended Report of Waste Discharge and any technical documents needed to demonstrate continued compliance with this Order. In the event of any change in ownership of the wastewater facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Regional Board office.

5. The Discharger shall maintain a copy of this Order and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel upon request.

6. The Discharger shall immediately notify Regional Board staff of any flooding, equipment failure, slope failure, or other change in site conditions, which could impair the integrity of waste containment facilities or precipitation and drainage control structures.

7. The Regional Board staff will review this Order periodically and will revise these requirements when necessary.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 April 2004.

for THOMAS R. PINKOS, Executive Officer

CDH:cdh/rac

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0058
FOR
CRIMSON RESOURCE MANAGEMENT CORP.
ASPHALTO STANDARD LEASE
ASPHALTO OIL FIELD
KERN COUNTY

Compliance with this Monitoring and Reporting Program, and with the Standard Provisions and Reporting Requirements dated 1 March 1991, is ordered by Waste Discharge Requirements Order No. R5-2004-0058.

Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements, constitutes noncompliance with the Waste Discharge Requirements and the Water Code, which can result in the imposition of civil monetary liability.

A. REQUIRED REPORTS

Report		Due
1.	Wastewater Monitoring (Section C.1)	**Annually**[1]
2.	Facility Inspection (Section C.2)	**Annually**[1]

[1] The Annual Report is due by 1 May of each year and shall include all analytical results and measurements performed during the year, and the facility inspection results.

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required by appropriate sections of the Standard Provisions and Reporting Requirements. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the Waste Discharge Requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible.

C. MONITORING

1. Wastewater Monitoring

At least once annually, a representative sample for wastewater analysis shall be taken at the point of discharge into the sumps. If discharge is not occurring, a representative sample shall be taken from wastewater within the sump nearest the discharge point. Chemical analyses used in monitoring shall be performed as required by Water Code Section 13176, Health and Safety Code Section 100825. Minimum analytical requirements for waste discharged at the facility are as follows:

Parameter/Constituent	Analytical Method [1]	Reporting Units
Total Annual Flow	estimate	bbl or gal
Electrical Conductivity, EC @ 25°C	EPA 120.1	µmhos/cm
Total Dissolved Solids, (TDS)	SM 2540C	mg/L
Chloride	EPA 300.0	mg/L
Boron	EPA 200.7	mg/L
Benzene, Toluene, Ethylbenzene, and Xylene compounds	EPA 8260	µg/L

[1] Other approved analytical methods may be proposed if they provide equal or greater accuracy or precision.

2. Freeboard Inspection

The freeboard shall be monitored on the sumps to the nearest tenth of a foot. A permanent marker shall be placed in the sumps with calibration including the water level at maximum capacity and available freeboard (minimum of two feet). Freeboard observations/measurements shall be conducted and recorded twice monthly. Freeboard monitoring reports shall be submitted with the annual reports.

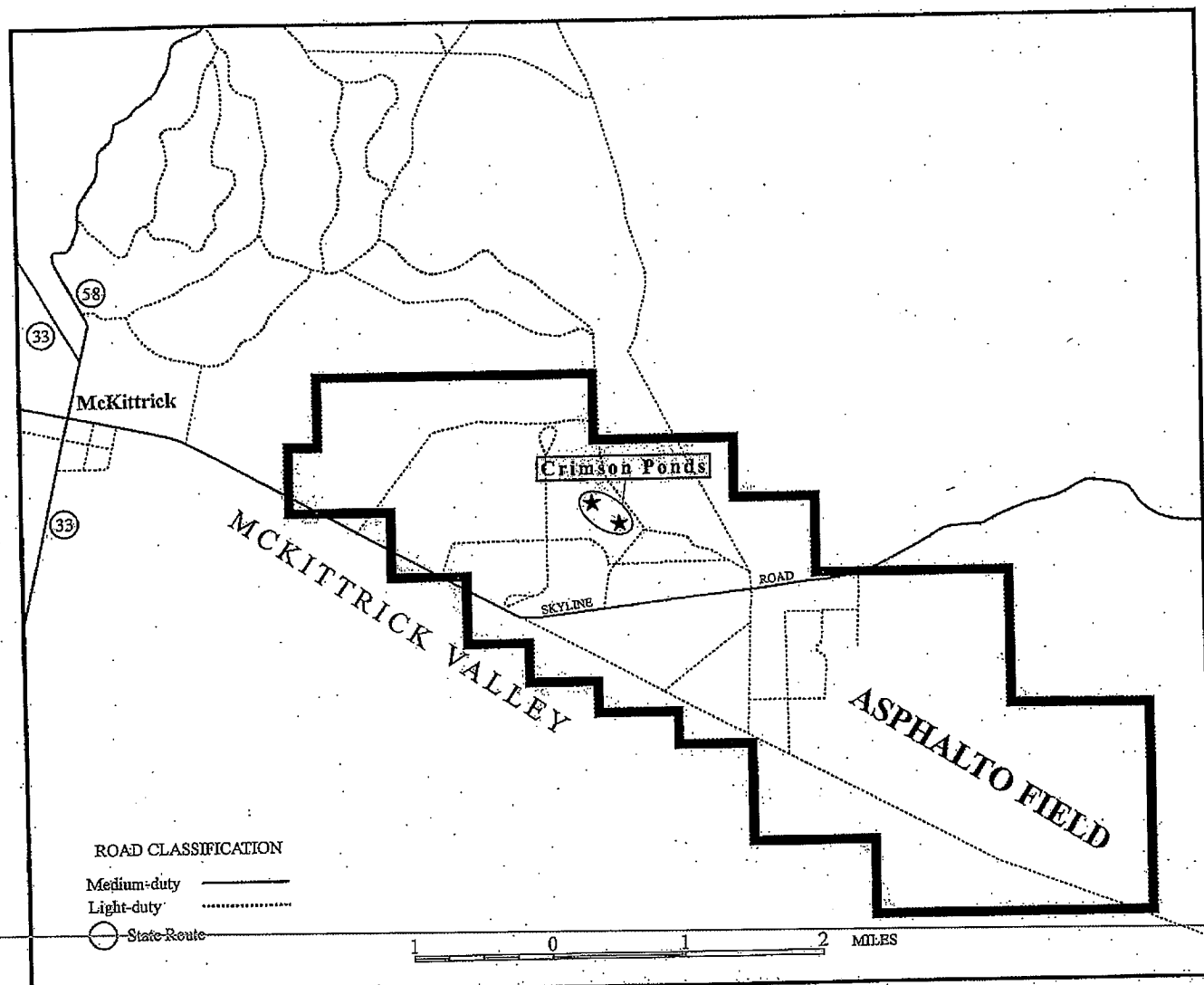
3. Facility Inspection

The Discharger shall inspect all surface impoundment and drainage facilities for damage annually and following any major storm event and report any damage within 24 hours. Necessary repairs shall be implemented as soon as practicable and the Discharger shall report any subsequent repairs within 30 days of completion. The results of inspections shall be summarized in the annual report.

Ordered by: _____
for THOMAS R. PINKOS, Executive Officer

23 April 2004
(Date)

CDH:cdh/rac



GENERAL LOCATION MAP

Order Number R5-2004-0058

Waste Discharge Requirements
Crimson Resource Management Corp.
Asphalto Standard Lease
Asphalto Oil Field
Kern County

W ½ SW ¼ of Section 23, T30S, R22E, MDB&M
West Elk Hills 7.5 Minute USGS Quadrangle

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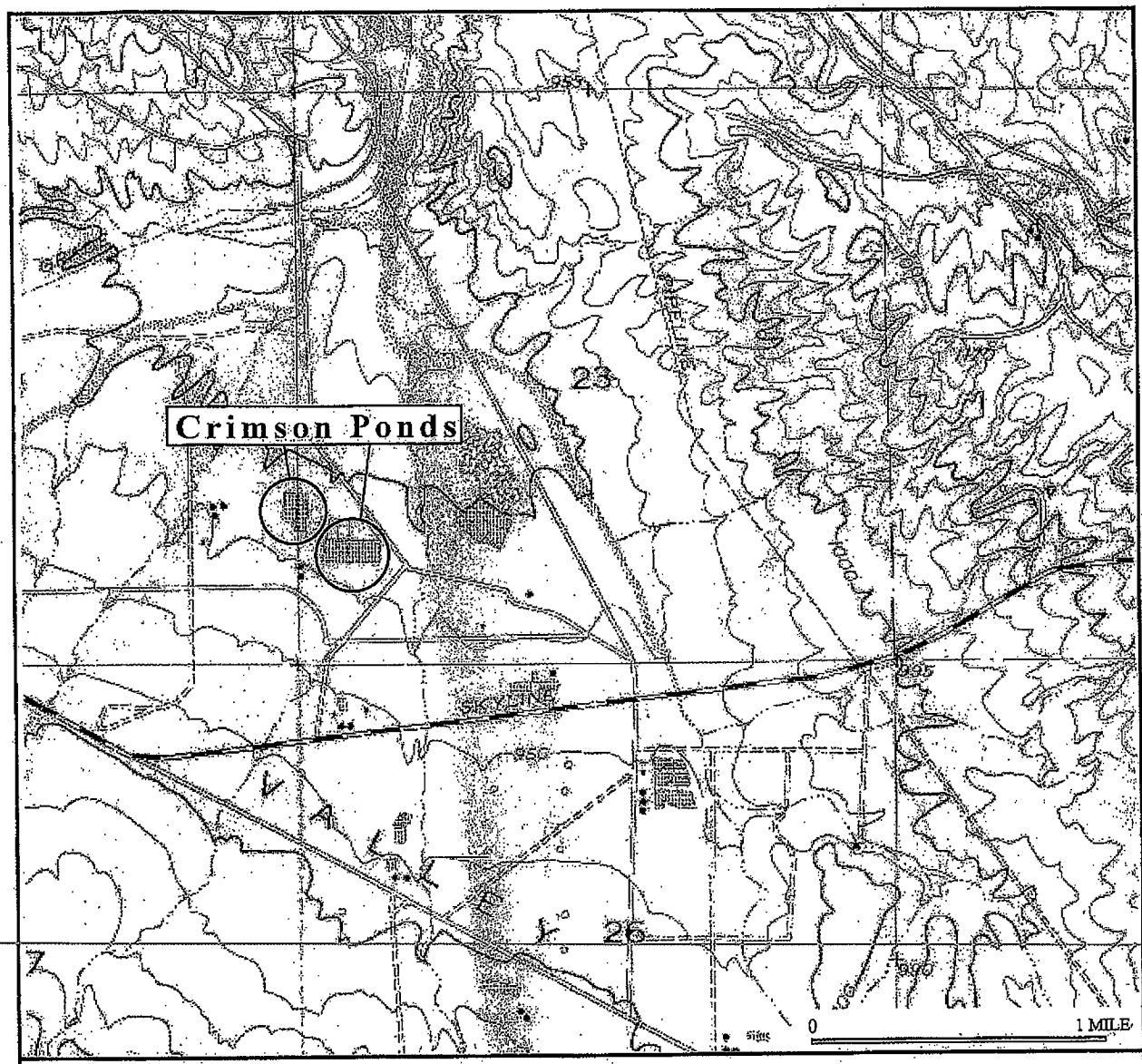
ATTACHMENT A



LOCATION MAP

Order Number R5-2004-0058

Waste Discharge Requirements
Crimson Resource Management Corp.
Asphalto Standard Lease
Asphalto Oil Field
Kern County

W ½ SW ¼ of Section 23, T30S, R22E, MDB&M
West Elk Hills 7.5 Minute USGS Quadrangle

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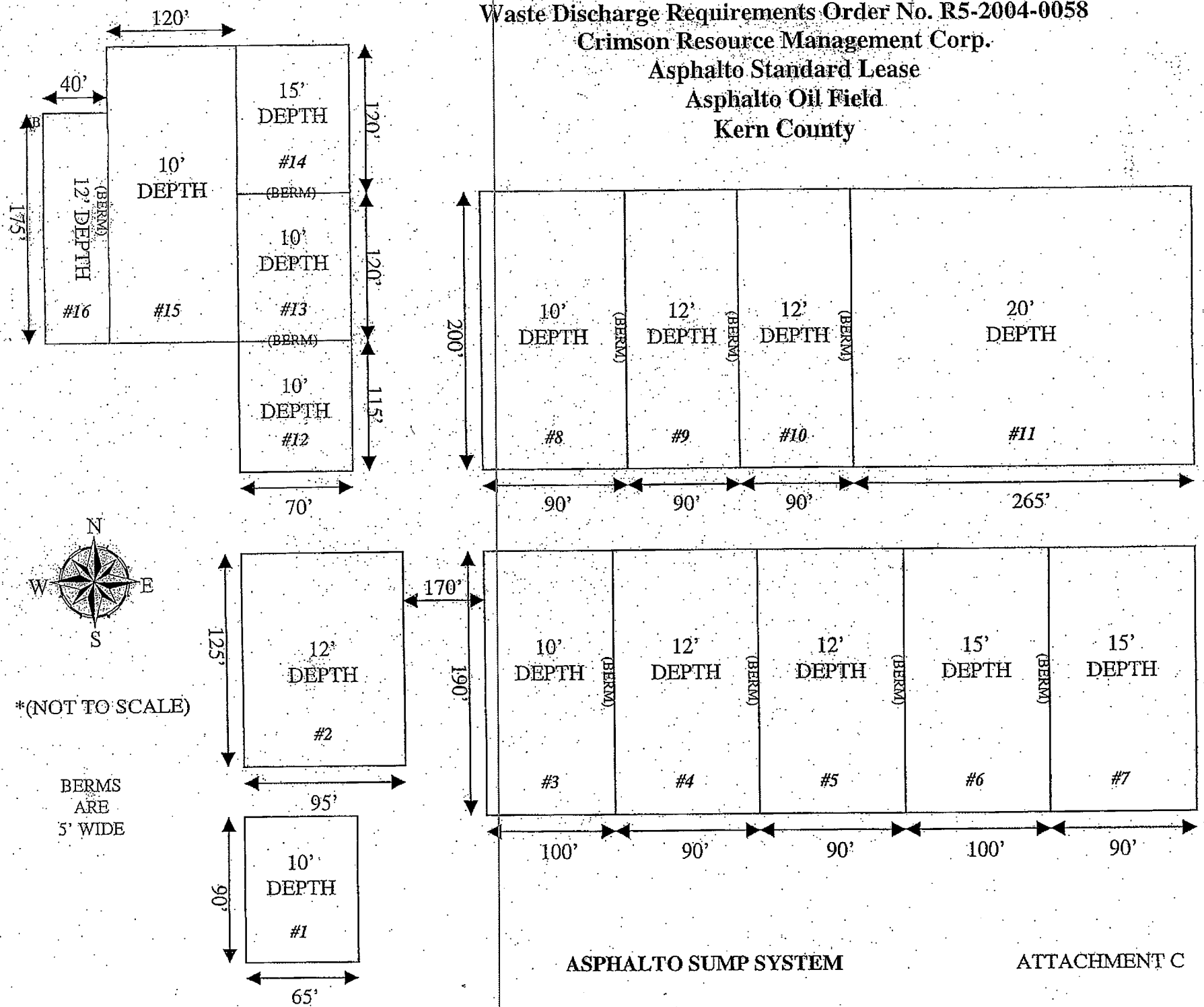
ATTACHMENT B

Waste Discharge Requirements Order No. R5-2004-0058
Crimson Resource Management Corp.
Asphalto Standard Lease
Asphalto Oil Field
Kern County



ASPHALTO SUMP SYSTEM

ATTACHMENT C

INFORMATION SHEET

ORDER NO. R5-2004-0058
CRIMSON RESOURCE MANAGEMENT CORP.
ASPHALTO STANDARD LEASE
ASPHALTO OIL FIELD
KERN COUNTY

Crimson Resource Management Corp. (Discharger) is a Colorado corporation that owns and operates crude oil production wells at the Asphalto Standard Lease in the W ½ of the SW ¼ of Section 23, T30S, R22E, MDB&M, Asphalto Oil Field. The field is approximately four square miles in size and Crimson Resource Management Corp. is one of only three dischargers in the oil field. The facility is approximately two miles southeast of the unincorporated community of McKittrick. Approximately 1,200 barrels/day of wastewater is currently being discharged to unlined sumps at the lease for disposal by solar evaporation and percolation. The facility has been in operation since the early 1960's.

Wastewater discharged at the lease has been regulated by Waste Discharge Requirements (WDRs), Resolution No. 64-05001. The WDRs are outdated and no longer consistent with Regional Board policy and State regulations. To achieve compliance with current policy and regulations, the WDRs are being updated and will incorporate regional hydrogeologic information developed from recent studies conducted in McKittrick Valley, designate the facility classification, and incorporate a monitoring and reporting program.

The climate in McKittrick Valley is semi-arid, with hot, dry summers and cool winters. The average annual precipitation is 5.6 inches and the average annual Class A pan evaporation is 95.7 inches. The facility is not within a 100-year flood plain.

The McKittrick Valley is a localized northwest-southeast structural trough formed by tectonic forces associated with the San Andreas Fault. The valley trough contains over 10,000 feet of sedimentary deposits ranging in age from the Jurassic to Recent. The most recent sediments deposited in the valley trough are the 1,500+ foot thick Pleistocene Tulare Formation and the Quaternary Alluvium, which ranges up to 450 feet thick in the center of the valley. No known faults occur on or near the facility.

The Alluvium consists of unconsolidated silt and clay with interbedded sand and gravel deposits derived from coalescing alluvial fans. The alluvial section is underlain throughout the valley, by an approximately 62-foot thick, laterally continuous, basal alluvial clay. Review of the geophysical logs indicates that the base of the upper alluvial sediments dip inward resulting in an elongated and continuous basin-like structure near the center of the McKittrick Valley.

A detailed hydrogeologic study was conducted for the McKittrick Valley area. Technical information was developed during the study characterizing the hydrogeologic conditions in the area of the Discharger's facility. There is no evidence of groundwater within the alluvial section beneath Asphalto or the McKittrick Valley.

However, groundwater occurs within the Upper Tulare at a depth of over 500-feet or nearly 200-feet below the basal alluvial clay, in a confined sand within the Upper Tulare. The groundwater is of poor quality, with a Total Dissolved Solids (TDS) concentration of greater than 6,200 mg/L and boron concentrations of approximately 10 mg/L. This Upper Tulare groundwater has no demonstrated beneficial uses, is isolated from usable groundwater in the south San Joaquin Valley, is not currently

used or likely to be used in the foreseeable future, and is not suitable for municipal or domestic supply. McKittrick Valley and Asphalto Oil Field are in an area where recent hydrogeological studies have been conducted to conclude that underlying poor quality groundwater has no beneficial uses and is isolated from usable groundwater to the east. There is no record of groundwater wells within 17 miles of the facility.

The West Kern Water District supplies domestic and industrial water to a 250 square mile area in western Kern County, including the McKittrick Valley area, from groundwater wells in the Tupman area. Other sources of water supply include State Water project deliveries and agreements with various Kern County water agencies.

Pursuant to 40 Code of Federal Regulation (40 CFR), Section 146.4, the Tulare Formation in the Asphalto Oil Field has been exempted by the U.S. EPA for the purpose of underground injection of non-hazardous fluids associated with the production of hydrocarbons. The California State Division of Oil, Gas & Geothermal Resources is the permitting authority for Class II injection wells used for the subsurface injection of produced oilfield wastewater.

Generally, designated waste is non-hazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan. The discharge of designated waste to land is subject to the requirements of Title 27, California Code of Regulations, Section 20090(b).

The Discharger is exempt from the requirements of Title 27 pursuant to Section 20090(b). The exemption is based upon: a) the Regional Board is issuing waste discharge requirements; 2) the wastewater discharge, as permitted in the Order, is in compliance with the applicable water quality control plan; and, c) the wastewater does not need to be managed according to Chapter 11, Division 4.5 of Title 22 as a hazardous waste.

The action to adopt WDRs for existing facilities is exempt from the provisions of the California Environmental Quality Act in accordance with Title 14, California Code of Regulations, Section 15301.

CDH:cdh/rac:4/23/2004

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS

1 March 1991

A. General Provisions:

1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

2. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.

3. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

   a. Violation of any term or condition contained in this order;

   b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts.

   c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;

   d. A material change in the character, location, or volume of discharge.

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4. Before making a material change in the character, location, or volume of discharge, the discharger shall file a new Report of Waste Discharge with the Regional Board. A material change includes, but is not limited to, the following:

   a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements.

   b. A significant change in disposal method, location or volume, e.g., change from land disposal to land treatment.

   c. The addition of a major industrial, municipal or domestic waste discharge facility.

   d. The addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.

5. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Regional Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

6. The discharger shall take all reasonable steps to minimize any adverse impact to the waters of the state resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.

7. The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

8. The discharger shall permit representatives of the Regional Board (hereafter Board) and the State Water Resources Control Board, upon presentation of credentials, to:

   a. Enter premises where wastes are treated, stared, or disposed of and facilities in which any records are kept,

   b. Copy any records required to be kept under terms and conditions of this Order,

   c. Inspect at reasonable hours, monitoring equipment required by this Order, and

   d. Sample, photograph and videotape any discharge, waste, waste management unit or monitoring device.

9. For any electrically operated equipment at the site, the failure of which could cause loss of control or containment of waste materials, or violation of this Order, the discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.

10. The fact that it would have been necessary to halt or reduce the permitted activity in Order to maintain compliance with this Order shall not be a defense for the discharger's violations of the Order.

11. Neither the treatment nor the discharge shall create a condition of nuisance or pollution as defined by the California Water Code, Section 13050.

12. The discharge shall remain within the designated disposal area at all times.

B. **General Reporting Requirements:**

1. In the event the discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the discharger shall notify the Board by telephone at (559) 445-5116 as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. The discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events.

This plan shall:

a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.

b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes or contingency plans.

c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

The Board, after review of the plan, may establish conditions that it deems necessary to control leakages and minimize their effects.

3. All reports shall be signed by persons identified below:

a. For a corporation: by a principal executive officer of at least the level of senior vice-president.

b. For a Partnership or sale proprietorship: by a general partner or the proprietor.

c. For a municipality state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.

d. A duly authorized representative of a person designated in 3a, 3b or 3c of this requirement if;

(1) the authorization is made in writing by a person described in 3a, 3b, or 3c of this provision;

(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a waste management unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named Position); and

(3) the written authorization is submitted to the Board.

Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted if this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are

significant penalties for submitting false information, including the possibility of fine and imprisonment."

4. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. Failing to furnish the reports by the specified deadlines and falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the discharger.

5. The discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706-2020
or the current address if the office relocates.

C. Provisions for Monitoring

1. All analyses shall be made in accordance with the latest edition of: (1) "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater" (EPA 600 Series) and (2) "Test Methods for Evaluating Solid Waste' (SW 846-latest edition). The test method my be modified subject to application and approval of alternate test procedures under the Code of Federal Regulations (40 CFR 136).

2. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the discharger, analyses performed by a non certified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Board.

Unless otherwise specified, all metals shall be reported as Total Metals.

3. The discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period my be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

Record of monitoring information shall include:

a. the date, exact place, and time of sampling or measurements,

b. the individual(s) who performed the sampling of measurements,

c. the date(s) analyses were performed,

d. the individual(s) who performed the analyses,

e. the laboratory which performed the analysis,

f. the analytical techniques or methods used, and

g. the results of such analyses.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.

5. The discharger shall maintain a written sampling program sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the discharger shall be familiar with the sampling plan.

6. The discharger shall construct all monitoring wells to meet or exceed the standards stated in the State Department of Water Resources Bulletin 74-81 and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.22

D. (This Section Not Applicable)

E. Conditions Applicable to Discharge Facilities Exempted From Chapter 15 Under Section 2511

1. If the discharger's wastewater treatment plant is publicly owned or regulated by the Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to California Code of Regulations, Title 23, Division 4, Chapter 14.

2. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except diversions designed to meet variable effluent limits) is prohibited. The Board may take enforcement action against the discharger for by-pass unless:

a. (1) By-pass was unavoidable to prevent loss of life, personal injury, or severe property damage. (Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can

reasonably be expected to occur in the absence of a by-pass. Severe property damage does not mean economic loss caused by delays in production); and

(2) There were no feasible alternatives to by-pass, such as the use of auxiliary treatment facilities or retention of untreated waste. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance; or

b. (1) By-pass is required for essential maintenance to assure efficient operation; and

(2) Neither effluent nor receiving water limitations are exceeded; and

(3) the discharger notifies the Board ten days in advance.

The permittee shall submit notice of an unanticipated by-pass as required in paragraph B.1. above.

3. A discharger that wishes to establish the affirmative defense of an upset (see definition in E.6 below) in an action brought for noncompliance shall demonstrate, through properly signed contemporaneous operating logs, or other evidence, that:

a. an upset occurred and the cause(s) can be identified;

b. the permitted facility was being properly operated at the time of the upset;

c. the discharger submitted notice of the upset as required in paragraph B.1. above; and

d. the discharger complied with any remedial measures required by waste discharge requirements.

In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof.

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Board by **31 January**.

5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to disposal. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

6. Definitions

a. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatement facilities, lack of preventive maintenance, or careless or improper action.

b. The monthly average discharge is the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging. This number is to be reported in gallons per day or million gallons per day.

Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges by the number of days during the month when the measurements were made.

c. The monthly average concentration is the arithmetic mean of measurements made during the month.

d. The "daily maximum" discharge is the total discharge by volume during any day.

e. The "daily maximum" concentration is the highest measurement made on any single discrete sample or composite sample.

f. A "grab" sample is any sample collected in less than 15 minutes.

g. Unless otherwise specified, a composite sample is a combination of individual samples collected over the specified sampling period;

(1) at equal time intervals, with a maximum interval of one hour

(2) at varying time intervals (average interval one hour or less) so that each sample represents an equal portion of the cumulative flow.

The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results.

7. Annual Pretreatment Report Requirements:

(Applies to dischargers required to have a Pretreatment Program as stated in waste discharge requirements.)

The annual report shall be submitted by **28 February** and include, but not be limited to, the following items:

a. A summary of analytical results from representative, flow-proportioned, 24-hour composite sampling of the influent and effluent for those pollutants EPA has identified

under Section 307(a) of the Clean Water Act which are known or suspected to be discharged by industrial users.

The discharger is not required to sample and analyze for asbestos until EPA promulgates an applicable analytical technique under 40 CFR (Code of Federal Regulations) Part 136. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and alpine Sampling and analysis shall be performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto.

b. A discussion of Upset, Interference, or Pass Through incidents, if any, at the treatment plant which the discharger knows or suspects were caused by industrial users of the system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass Through, Interference, or noncompliance with sludge disposal requirements.

c. The cumulative number of industrial users that the discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.

d. An updated list of the discharger's industrial users including their news and addresses, or a list of deletions and additions keyed to a previously submitted list. The discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:

(1) Complied with baseline monitoring report requirements (where applicable)

(2) Consistently achieved compliance;

(3) Inconsistently achieved compliance;

(4) Significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);

(5) Complied with schedule to achieve compliance (include the date final compliance is required);

(6) Did not achieve compliance and not on a compliance schedule;

(7) Compliance status unknown.

A report describing the compliance status of any industrial user characterized by the descriptions in items (d)(3) through (d)(7) above shall be **submitted quarterly from the annual report date** to EPA and the Board. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

e: A summary of the inspection and sampling activities conducted by the discharger during the past year to gather information and data regarding the industrial users. The summary shall include but not be limited to, a tabulation of categories of dischargers that were inspected and sampled; how many and how often; and incidents of noncompliance detected.

f. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:

(1) Warning letters or notices of violation regarding the industrial user's apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations;

(2) Aministrative Orders regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;

(3) Civil actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;

(4) Criminal actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.

(5) Assessment of monetary penalties. For each industrial user identify the amount of the penalties;

(6) Restriction of flow to the treatment plant; or

(7) Disconnection from discharge to the treatment plant.

g. A description of any significant changes in operating the pretreatment program which differ from the discharger's approved Pretreatment Program, including, but not limited to, changes concerning: the program's administrative structure; local industrial discharge limitations; monitoring program or monitoring frequencies; legal authority or enforcement policy; funding mechanisms; resource requirements; and staffing levels.

h. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.

i. A summary of public participation activities to involve and inform the public.

j. A description of any changes in sludge disposal methods and a discussion of any concerns not described elsewhere in the report.

Duplicate signed copies of these reports shall be submitted to the Board and:

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

And

State Water Resources Control Board
Division of Water Quality
Regulatory Unit
P.O. Box 944213
Sacramento, CA 94244-2130

Revised December 1995 to update signatory requirements (B.3.c).
Revised March 1997 to reflect Fresno Office information, delete Section D, and update C.1

# # # # #

Appendix B

Sample Inspection Forms